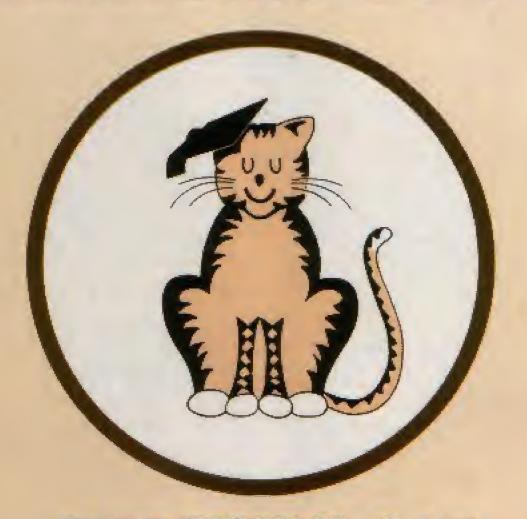


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News

All that's new in the growing world of the Electron.

Beginners

Part three of Pete Bibby's gentle introduction to very basic Basic.

Notebook

A simple graphics program explained. 12

Showtime

Come and meet us at the Electron and BBC Micro User Show. 14

Pelican

Let your Electron teach you to cross the road in safety.



Limerick

Did you know your Electron can produce reasonable rhymes? 22

Chess Timer

You think about your moves - while your Electron keeps track of the time.

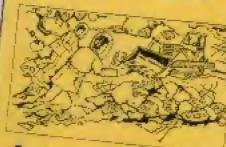


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All you want to know about the latest in software from our trank reviewers.

Adventures

Learn your way around the mysterious, mystifying world of 30 adventure games.



Asteroids

Join the hunt for stellar minerals in this space game with a difference. 34

Maths Workout

Binary numbers made surprisingly simple. 36

Bookshop

Read all about it with the best books for the Electron.

Frieze

Fancy redecorating? Let your Electron help design the wallpaper. 40

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38

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48



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27

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The pages you write yourself. A selection from our mailbag. 61



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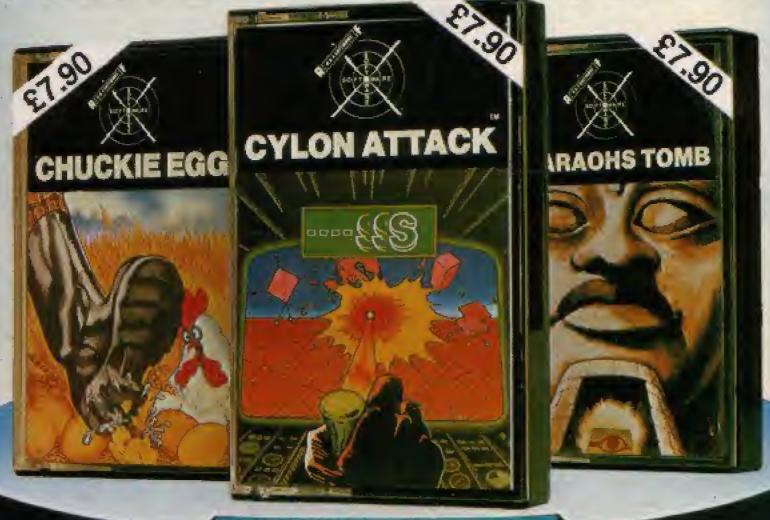
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Production problems Still dog Acorn



Tom Hohenburg

On show at the B-I-G show

THE spring Electron and BBC Micro User Show will see the launch of First Byte Computers' new switched joystick interface for the Electron.

The unit, which allows Electron owners to use any Atari style joysticks, consists of a plug-in cartridge that fits on the expansion board at the back of the micro.

This is only one of many new products that will make their debut at the show, being held at the Royal Horticultural Hall, Westminster, from Thursday March 29 to Sunday April 1.

First Byte has taken

Turn to Page 6

HOPES that Acorn had finally cracked its Electron production problems with the signing up of two additional manufacturers have not materialised.

Rather than more becoming available, in the last few weeks supplies have virtually dried up.

And dealers who believed Acorn's pre-Christmas promises of lots more Electrons going on sale in January have had to tell potential customers that they have no idea when they will be able to meet their orders.

Acute

The problem is getting more acute every day, with orders for the seemingly non-existent machines soaring dramatically.

The total backlog of orders now stands at almost a quarter of a million machines.

Last October Acorn

announced that because the Malaysian factory could not produce anything near the number of Electrons needed, a new production line was being set up in Wales.

The firm claimed it would be turning out 4,000 a week from January. They now admit no Welsh-built Electrons will be available until April at the earliest.

They also announced they were setting up a third production line in Hong Kong.

But when Electron User spoke to the manufacturers they said that they too would be unable to start shipping them to Britain for another few weeks.

While confirming that the three plants would soon be in full production, Acorn's marketing manager Tom Hohenburg sounded a note of caution:

'With the best will in the world we cannot simply produce hundreds of thousands of machines just like that", he said.

Although Acorn will not give any details, it is understood that one tiny component, a custom-made control device, has been responsible for freezing production on the Electron.

This problem is now said to have been resolved and the production lines are able to move into top gear.

High failure rate

THE problem caused by the shortage of Electrons is being compounded by the unusually high failure rate of machines that have been sold so far.

Dealers contacted by Electron User say they have had to return between eight and 25 per cent of the machines they have sold because of faults.

But full marks to Acorn in a difficult situation. They have made it a priority to replace defective machines immediately.

Just think of a game ...

DID you know that it might one day be possible to control your Electron by the power of thought alone?

Apparently researchers in behavioural engineering in California are working on games that users can play simply by thinking about what they want to do.

The idea is that the player holds an object that

is sensitive to the galvanic skin response, just like lie detectors. Thoughts can affect the conductivity of the skin and variations in this can be used to control the game.

While it may seem to be a lot of trouble to go to in order to play Space Invaders, the research could be of great benefit to the physically handicapped.

Education market booming

THE Electron is following in the footsteps of its big brother, the BBC Micro, by its wide use in education.

More and more schools are now ordering Electrons as additional machines to their BBC Micros.

Software companies are also looking to the new market to increase their sales.

One of the first on the

scene aré Bourne Educational Software of Hampshire.

They have released three programs aiming to help children develop counting, number recognition and compass skills.

Rewritten especially for the Electron, each of the programs comes with an explanatory booklet.

Although Bourne are

an independent company, they are being distributed by Acornsoft following the Acorn subsidiary's new policy of buying in software from other companies.

Not to be left out, Squirrel Software of Manchester have developed a program aimed at helping remedial readers.

Called Visual Recall the software has already

proved its worth in extensive testing in schools, helping children with many different kinds of reading difficulties.

From Golem of Bracknell comes Jigsaw Puzzles, a set of six programs for the Electron.

Suitable for children from five to 12 years of age, they were written to help in the develop-

ment of special concepts and in the formation of problem solving strategies.

Silversoft of London are converting their successful series of BBC Micro educational programs to run on the Electron.

They are also releasing what promises to be the first disassembler to be produced for the Electron.

Speedy loading on way

GOOD news for Electron owners frustrated with the slowness of saving and loading from cassette. Your problems may soon be over.

Two firms already well known in the BBC Micro world are planning ways of speeding things up.

The first is Pace of Bradford. Already one of the leading suppliers of disc filing systems for the BBC Micro, they are actively engaged in producing a similar system for the Electron.

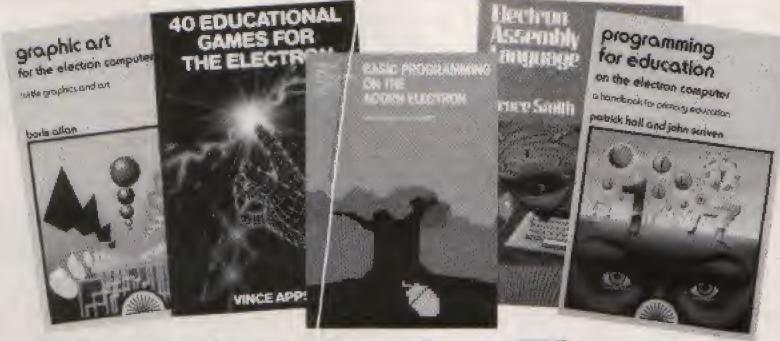
This means programs will be able to be loaded and saved in a matter of seconds rather than minutes, giving Electron users more time to use their machines.

From Ikon Computers of Dyfed comes the promise of another faster storage method, the Hobbit.

This is a tape based system whose speed approaches that of discs.

Well known to BBC Micro users, the Hobbit has recently had its price reduced and its speed increased.

This will make it a serious rival to disc based systems when it is released, hopefully later in the year.



More books for Electron

SPRING this year will see a flood of books covering all aspects of the Acorn Electron.

Beginners are well served by Neil and Pat Cryer's "Basic Programming on the Acorn Electron".

Well known for their book on the BBC Micro. the Cryers have repeated the same step by step, non-technical approach aimed at absolute novices.

However, the new books aren't all aimed at the elementary end of the market.

From Shiva comes Bruce Smith's Electron Assembly Language, a simple, well illustrated guide to using machine code to tap the hidden depths of the Electron.

With its treatment of the use of the Electron's built in assembler – one of its best features – and its explanation of the operating system, the book will open a whole new world to the Basic programmer.

Another specialist field, education, is well served by two of the new literary crop.

From Granada, who appear to be taking the lead in publishing for the Electron, comes "40 Educational games for the Electron" by Vince Apps.

Not to be outdone, Sunshine have brought out "Programming for Education on the Electron Computer".

Written by two teachers, Patrick Hall and John Scriven, the book is aimed at the primary education sector.

Sunshine have also produced "Graphic Art for the Electron Computer" by Boris Allan, the first book aimed specifically at exploring the Electron's graphics capabilities.

Database link planned

From Page 5

steps to ensure that Electron games now under development will be compatible with the new interface.

They have contacted all leading software houses giving details of the interface's software requirements and asking for their cooperation.

"We have been delighted by the help we've had from everyone", said Ray Threadgold of First Byte.

"Aire ady A & F Software's Cylon Attack allows the use of our interface, and lots more are planned".

Other new products for the Electron are appearing thick and fast.

Not content with producing a joystick interface, Protek Computing of West Lothian has developed what promises to be the first modern for the Electron.

It allows users to talk to each other and mainframe computer databases such as Prestel over the telephone system.

This will vastly expand the scope of the micro.

Production is ready to go ahead as soon as British Telecom approves the production model.

Electron Eddie-torial

I WAS grabbed as soon as I walked in the door. "Pete, have a look at this, it's the first program I've ever written".

Tom put the cassette into the player and proudly LOADed his masterpiece.

"Watch this", he said as he typed in RUN and pressed Return.

It was really nice. Not the most original program I'd ever seen, but certainly an accomplished one.

He had made full use of the Electron's graphics abilities and the program was neat and crisp, well structured and well thought out. A competent piece of work.

"I like it", I said, wondering when I could use it in Electron User.

At that moment his dad came into the room.

"Look at that", Tom said, "it's my first program".

"Oh yes, very nice. What does it do?"

Tom's face dropped. What did it do?

I could have wept. I mean, did anyone walk up to Leonardo da Vinci when he'd finished the Mona Lisa and say: "Very nice, what does it do?"

What could I say? The guy had created a really nice program, showing that he had a thorough grasp of basic graphics and could use his knowledge practically.

Anyone who knew a little about micros would have been impressed, yet here he was, floored.

It was so frustrating. If he'd bought a radio instead of a micro and spoken to someone in Australia, everyone would have been thrilled.

If he'd have spent his money on a track suit and running shoes and trained up to run 26.2 miles in a marathon no one would bother asking why.

As it was he bought an Electron and used his time to understand how it worked and to create

something that, however simple, was uniquely his.

He imagined it, thought about it and achieved it in practice. He'd used his micro creatively to express a part of himself.

And he'd been asked why.

I thought about it for quite a while, trying out different replies to his dad's question. Eventually I got the right answer.

So when you show someone your program and they ask you what it's for, don't bother trying to explain.

Just tell them: "If you have to ask the question, you'd never understand the reply".

Pete Bibby

Not so much what it does as how it does it . . .

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Part Three of PETE BIBBY'S introduction to programming

LAST month we saw how to write our own programs. Admittedly they were fairly trivial. But programs they were, exhibiting the basic features of any program.

This month we'll be looking at some ways of improving them and the output they produce on screen.

Again the examples won't be much to write home about, but it's the principles involved we're after.

Try the programs for yourself and see if you can understand how they work and if you can improve them.

Remember, it's a "hands on" course and you'll get a lot more out of it if you work through it on your Electron.

First though, let's have a look at what we've done so far.

We saw last month that a Basic program consists of a numbered sequence of instructions to the computer.

We entered these instructions, one after the other, giving each a line number.

These line numbers went

Unravel that and pick up some hints

up in steps of 10, allowing us to slip in other instructions if necessary.

We saw that we could replace a line with an altered version simply by typing in a new version, giving it the line number of the line we want it to replace.

If we wanted to get rid of a line completely we just typed in that line number and pressed Return.

We found that the Electron

didn't obey these instructions straight away but waited until we typed in RUN, followed by the inevitable press of the Return key.

Finally we learned that we could use LIST to get the micro to display a list of instructions, NEW to clear it out of memory and CLS to clear the screen.

Now let's get cracking on the Electron. Type in Program

10 REM PROGRAM 1

20 PRINT "HELLO"

30 PRINT"DUT"

40 PRINT "THERE"

Enter RUN and press Return. This will tell the micro to obey the instructions that it will find in its memory.

It starts at the one with the lowest line number. After that has been done it goes on to the next one and so on until it runs out of instructions.

As you'll see from the screen, the program displays the message:

HELLO

THERE

This is using the same techniques we came across last month. But the more observant of you might have noticed there is a new keyword.

This is the REM of line 10 and it is one of the easiest Basic statements to use and understand.

REM is short for remark, and the REM statement allows you to put remarks into your programs.

The Electron will ignore

anything after a REM statement. When it finds one, it goes on to the next line number.

This allows you to put in your own remarks after the REM without upsetting the micro.

This can be very useful when you start to write longer programs. The remarks after the REM statements help to make the program more understandable.

Many a program has been saved from obscurity by a liberal use of REM statements.

In Program I the REM is used to make a note of the program title. The Electron doesn't read the PROGRAM I after the REM but goes straight to line 20.

I could have put in all sorts of remarks after the REM and the micro would still ignore them, no matter how personal I got!

Try leaving out the REM of line 10 and see what happens. The Electron is looking for a keyword, a Basic word of power. It is quite confused by the PROGRAM I which it finds after the line number.

Let's leave the REM statement for a while and go on to Program II, which prints out the same message in a different way.

But first, don't forget to type in NEW and press Return to get rid of the old program from memory.

10 REM PROGRAM II

20 PRINT"HELLO", "OUT", "THERE"

Some of you may have looked at Program I and wondered why I used three



string

PRINT commands in separate lines to print out the three bits of the message. Wouldn't one PRINT do?

Well, it will as Program II shows, though the message does look a bit spaced out.

The reason why it is spread across the screen is that we've put commas between the strings. "The what?" I hear you ask. The strings.

Put at its simplest, a string is just a piece of text placed in quotation marks. The Electron treats everything it finds inside quotation marks as one lump or string.

We've already used three strings in this article. They are "HELLO", "OUT" and "THERE". The Electron found one of these after each print statement of Program 1.

The quotation marks told in that what followed was a string, and it printed out the whole string as one lump. Notice that it doesn't print the quotation marks. They are just there to mark the beginning and the end of the strings.

Strings are very important in programming. But for the moment we'll leave it at that and go on to see why Program Il printed the strings "HELLO", "OUT" and "THERE" in the way that it did.

As we might expect, the strings were displayed on the same line but without their inverted commas. But why were there the gaps between the words on the screen?

The answer is because we put commas between the strings – or we did if we typed the program in properly.

If we do this after a print statement it tells the micro to display each string on a separate part of the screen.

In the normal course of events the Electron divides the screen into four groups of 10 characters each. If instructed by commas between them, it will print the strings in separate fields.

Try:

PRINT "ONE", "TWO", "THREE", "FOUR"

and you'll see the separate print fields.

What happens if you enter:
PRINT "ONE", "TWO",
"THREE", "FOUR",
"FIVE", "SIX"

and press Return? Try it and

There's a lot more to these print fields, as they are called. But the point to grasp is that when commas separate the strings after a PRINT command then the strings are displayed in separate fields.

Let's see what happens when we run Program III:

10 REM PROGRAM III

20 PRINT "HELLO"; "OUT"; "THERE"

As you can see it's very much like Program II, only the commas have been changed to semicolons.

This effectively "glues" the strings together, overwriting the print fields we came across earlier.

The trouble is that the output looks a mess. There are no spaces between the words.

All the Electron does is print out the first string - "HELLO".

Then it finds the semicolon, which tells it to print whatever comes next straight away without any gaps.

The Electron doesn't know that you need spaces to make the words clear. If you want spaces, you have to add them yourself.

Run Program IV and see the result:

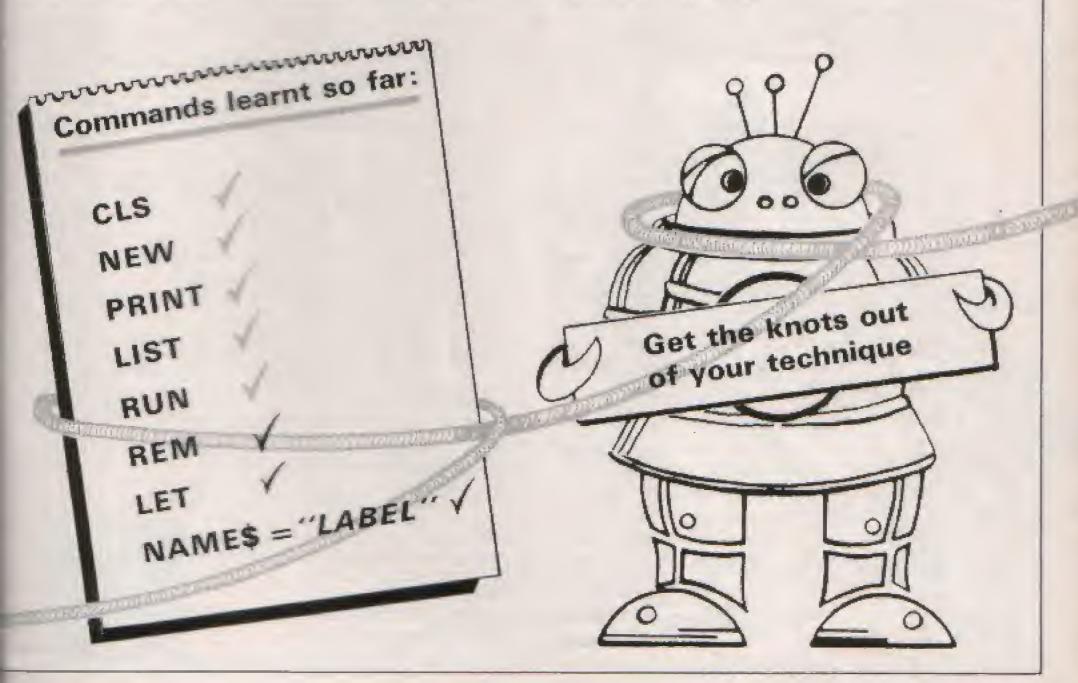
10 REM PROGRAM IV

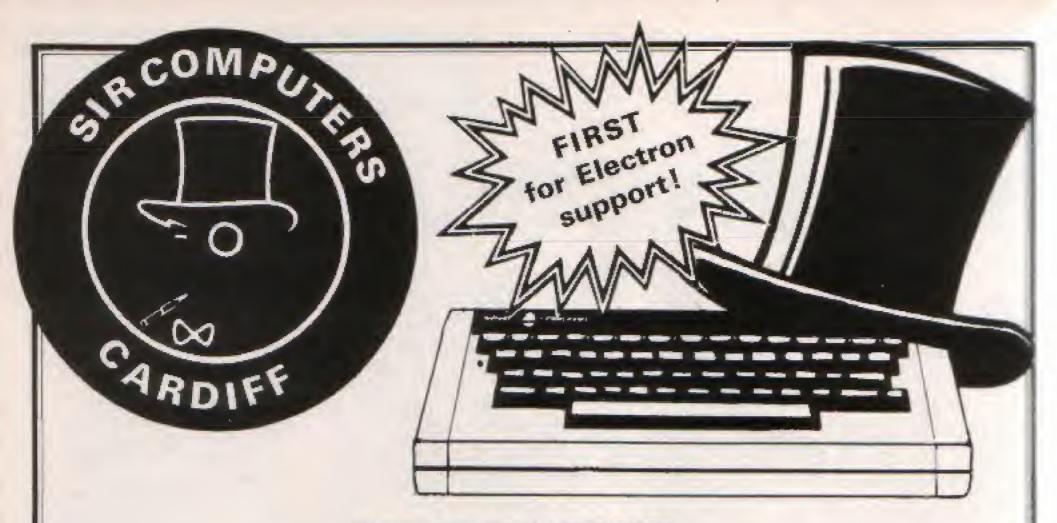
20 PRINT"HELLO "; "OUT "; "THERE"

Here we've included the two necessary spaces in the strings. The Electron doesn't mind.

It will print out whatever it finds between the inverted commas — letters, numbers, spaces or any combination of them.

So now we've got our





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From Page 9

program to print out the massage on one line, neathy spaced. It's taken us a long time to get here, hasn't it?

Still, the principles involved will stand you in good stead in your programming career.

Mind you, we could have saved ourselves a lot of trouble if we'd run Program V:

10 REM PROGRAM V

20 PRINT"HELLO BUT THERE"

This just prints out one long string. Simple isn't it?

You may be wondering unity we didn't do this in the first place. Well, with this message you could.

But the Electron sets a limit to the length of any one string. I leave you to work it out.

When you use long messages, you'll find that you need to know all the above techniques and how punctuation affects the PRINT command.

There's one more piece of punctuation that we haven's touched yet - the apostrone.

Have a go at Program. Be careful when you type it in that you don't get confused between the puctuation marks:

10 REN PROGRAM WE

20 PRINT HELLO " "BUT " "THERE"

We're back to the beginning again! Well, not quite because we have done it in her the number of lines.

As you can see the apostrophe between the strings tells the Electron to print the next string it finds at the beginning of a new line.

This can be quite useful for spacing out long messages.

Try using two or three apostrophes between the strings, and you'll see what I mean.

So we can now write out simple programs to display messages.

We're not just stuck with HELLO OUT THERE. We can put anything we want between the inverted commas and the Electron will display it.

The trouble is that the messages can get quite long. When you have had a little more experience you'll find that you're using PRINT to display quite large strings on the screen.

Take the case of the instructions for computer games. The part of the program that displays these uses exactly the same methods as we have done, only it has a lot more to say.

Also it might say the same thing at several points in the game, for example: "PRESS RETURN FOR ANOTHER GO".

It would be daft if we had to type in all the words every time we came to it.

Couldn't we give it a label and just tell the micro to print the label? It would save a lot of typing.

The answer is yes, and the use of labels is shown in Program VII:

to REM PROGRAM VII

20 LET AS="HELLO"

30 LET B\$="OUT "

40 LET C#="THERE"

50 PRINT AS

60 PRINT B\$

70 PRINT CS

As you can see, the result is the same as before, only we've used a different method. We have given each of the strings a label.

Now when we want the Electron to do something with the string we can use the label to refer to it.

Since the label is shorter in length than the string, this saves a lot of typing.

The labels I have used are AS, BS, CS. The fact that they are in alphabetical order means nothing. I just picked them like that.

Nor does the name have to be so short – you can try other names.

The important thing to notice is that each one ends in a dollar sign, \$. You'll find this above the 4 on the keyboard.

The rule is that if we want to refer to a string by a label — properly, called a variable name — then that name must end in \$ or else the Electron will get confused.

Let's take a closer look at Program VI. You'll notice that there is a new keyword in lines 20, 30 and 40.

This is the keyword LET. It tells the Electron that in future the string on the right of the equals sign will be referred to by the label on the other side of the equals sign.

It is important to remember that the label, the name you're giving to the string, comes after the LET.

The actual string you're labelling comes after the equals sign.

So lines 20, 30 and 40 assign labels to our three faithful old strings.

Lines 50, 60 and 70 then use PRINT to display the strings. But they refer to the strings by the labels we gave them in lines 20 to 40.

In this case using labels didn't save us much typing, but let's go back to the game instructions where it will,

It makes life much easier to have a line like;

10 LET MESSAGE\$="PRESS RETURN FOR ANOTHER 60"

Now if you want the message you can just use the label in a line like:

40 PRINT MESSAGE\$ rather than type in something like:

40 PRINT "PRESS RETURN FOR ANOTHER 80" which would be fairly time consuming if we wanted the same message over and over again.

You'll see from Program VIII that we can use the labels exactly as if they were the strings themselves.

Here we only use one PRINT command to display the message, with the punctuation between the labels acting just as if the string themselves were there.

IO REM PROGRAM VIII

20 LET AS="HELLO "

30 LET B\$="DUT "

40 LET C\$="THERE"

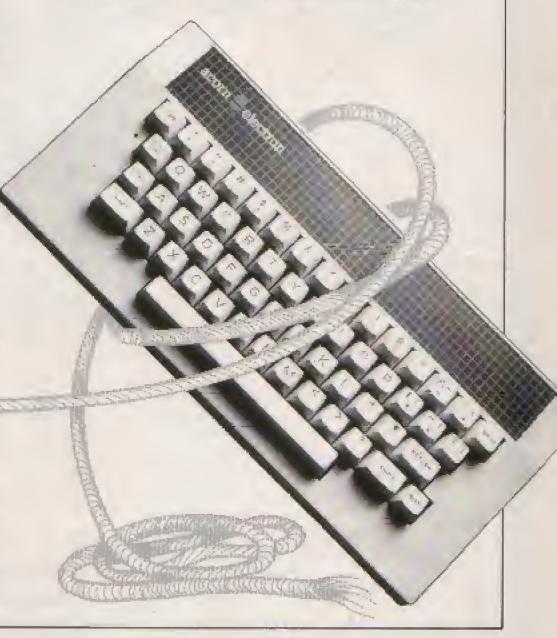
50 PRINT AS; BS; C\$

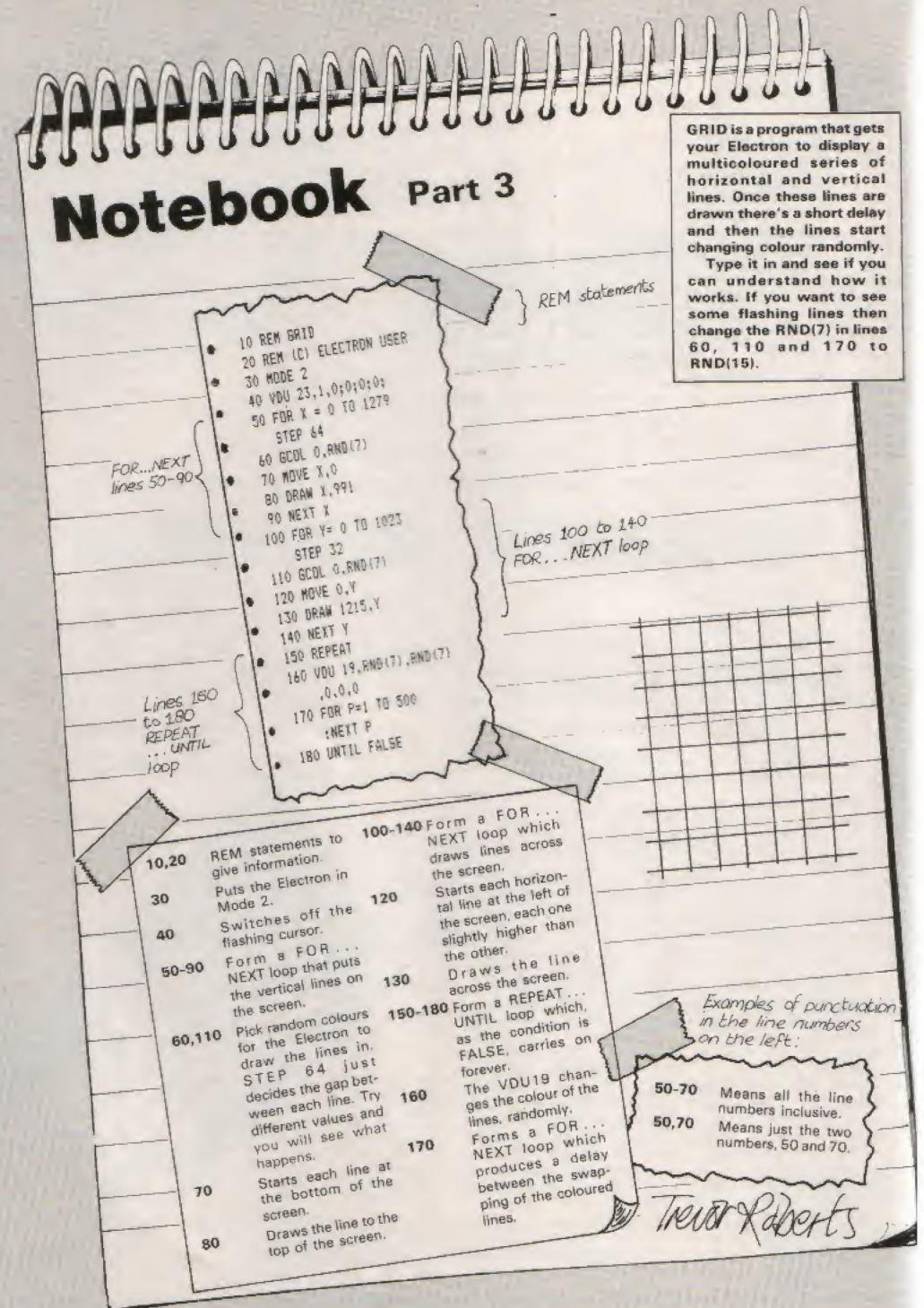
Try it out with commas and apostrophes between the labels and see for yourself what happens.

There's a lot more to strings than we have covered in this article, but for the moment that's enough.

Try writing a few of your own programs to print messages on the screen.

Use labels as much as possible to make your life easier, and soon strings will become second nature.





Make light work of listings!

All program listings in Electron User have been put on tape - to save you the chore of keying them in yourself. Four tapes are now available for the February, March and April issues, plus a bumper tape of all the programs from the first few introductory issues.

On the April tape:

SPACEHIKE A hopping arcade classic. FRIEZE Electron wallpaper. PELICAN Cross roads safely. CHESSTIMER Clock your moves. ASTEROID Space is a minefield. LIMERICK Automatic rhymes. ROMAN Numbers in the ancient way. BUNNYBLITZ The Easter program. DOGDUCK The classic logic game, NOTEBOOK Coloured grids. BINARY A base program.

On the March tape:

CHICKEN Let dangerous drivers test your nerve. COFFEE A tentalising word game from Down Under, PARKY'S PERIL Parky's lost in an imposite maze. REACTION TIMER How fast are you? BRAINTEASER A puzzling program. COUNTER Mental arithemetic can be fun! PAPER, SCISSORS, STONE Out-guess your Electron. CHARACTER GENERATOR Create shapes with this utility. FUNNY POLYGONS Fast graphics going round in circles. RABBITS Easter oursies a over! DRAW Multi-coloured lines. MEAN Just an average program,

On the February tape:

NUMBER BALANCE Test your powers of mental arithmetic. CALCULATOR Make your Electron a calculator. DOILIES Multi-coloured patterns galore. TOWERS OF HANOI The age old puzzle. LUNAR LANDER Test your skill as an astronaut. POSITRON INVADERS A version of the old arcade favourite. MOON RESCUE Avoid the asteroids and save the spacemen. STARS A program making pretty pictures. TAPESTRY Samuelry and colour combine,

On the introductory tape:

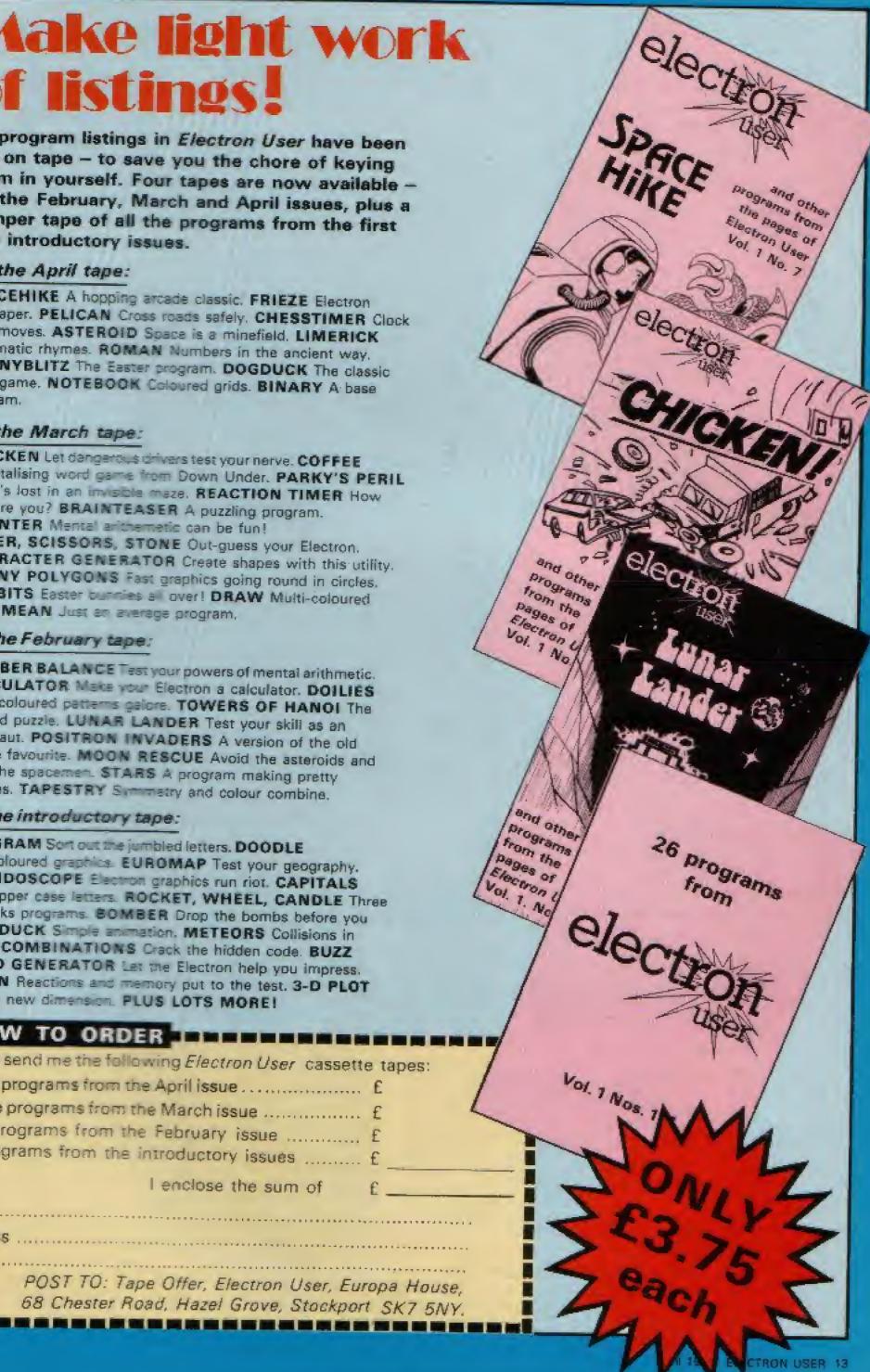
ANAGRAM Sort out the jumbled letters. DOODLE Multicoloured graphics EUROMAP Test your geography. KALEIDOSCOPE Electron graphics run riot. CAPITALS New upper case letters. ROCKET, WHEEL, CANDLE Three fireworks programs. SOMBER Drop the bombs before you crash. DUCK Simple animation. METEORS Collisions in space. COMBINATIONS Crack the hidden code. BUZZ WORD GENERATOR Let the Electron help you impress. SIMON Reactions and memory put to the test. 3-D PLOT Enter a new dimension. PLUS LOTS MORE!

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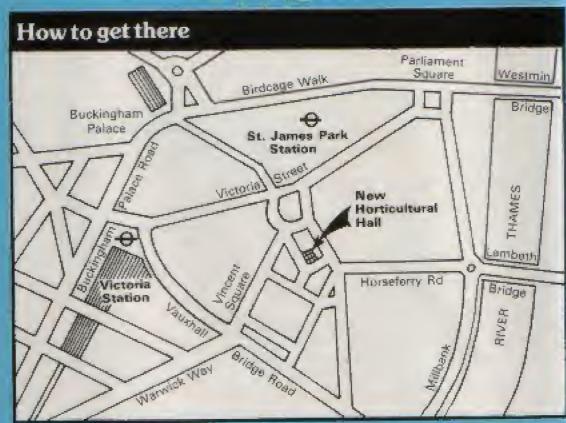
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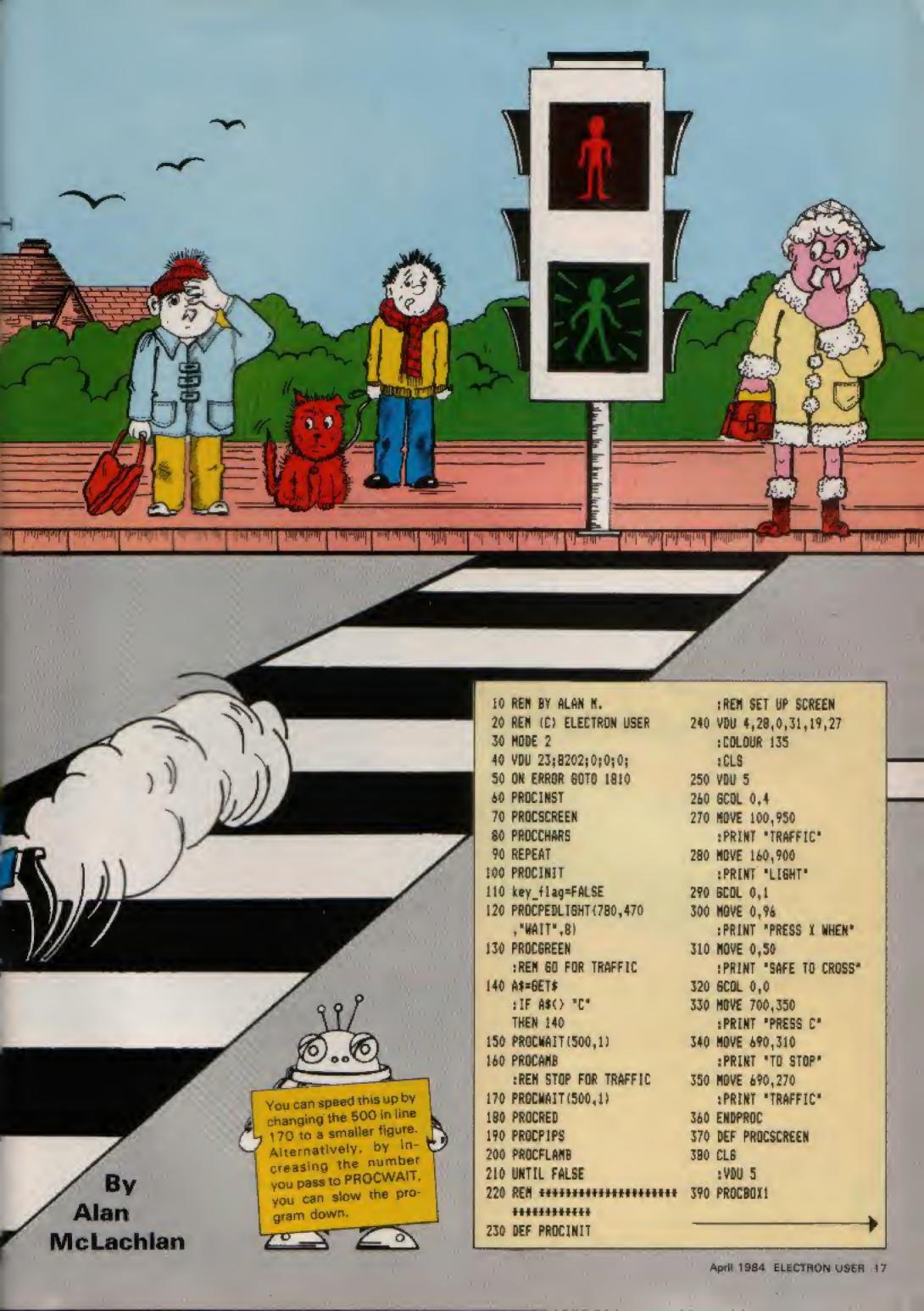


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Pelican listing

From Page 17

400 PROCBOX2

410 PROCEDX3

420 PROCPEDMAN(13)

430 PROCLIGHTON (310,730

,11

440 PROCLIGHTON (310,510

,3)

450 PROCLIGHTON (310, 290

460 ENDPROC

470 REM ################# *******

480 DEF PROCLIGHTON (XX.YX

, C7.1

490 VDU 19,1,0;0; 500 VDU 19,2,0;0;

510 VOU 19,3,0;0;

520 VBU 19,13,1;0;

530 RI=60

540 VDU 29, XX; YX;

550 GCGL O,CX

540 MOVE 0.0

570 FOR I=0 TO P1 #3

STEP . 25

580 MOVE 0.0

590 PLOT 85,RX+COS 1,RX+

SIN I

600 NEXT

610 VDU 29,0;0:

620 ENDPROC

630 REM ################ *****

640 DEF PROCRED

650 IF key flag ENDPROC

660 VDU 19,1,1;0;

670 VOU 19,2,0;0;

680 VDU 19.3,0:0:

690 VOU 19,13,2;0;

700 PROCEDX3

710 ENGPROC

医基金管张子萨斯特斯特斯

730 DEF PROCAMB

740 IF key flag ENDPROC

750 YDU 19,3,3;0;

760 YOU 19,2,0;0;

770 YDU 19,1,0;0;

780 ENDPROC

790 REM ##################

800 DEF PROCELAKB

BIO IF key_flag ENDPROC

820 VDU 19,1,0:0;

830 FOR 11=0 TO 10

840 VDU 19,3,3;0;

850 VDU 19,13,2;0;

860 PROCHAIT (90,1)

This listing was produced using a special formatter which breaks one program line over several lines of listing. When entering a line don't press Return until you come to the next line number. Full details of the formatter are given on Page 4 of the February issue.

870 VDU 19,13,0:0:

880 VDU 19,3,0:0:

890 PROCWAIT (90.1)

POO NEXT

910 ENDPROC

920 REM **************

930 DEF PROCEREEN

940 VOU 19.2,2;0;

950 VDU 19.3.0:0:

960 VOU 19,1,0;0;

970 YDU 19,13,1;0;

980 ENDPROC

990 REM ***************

1000 DEF PROCPEDLIGHT (AX

,B%,L\$,C%)

Tota GCOL 0,CZ

1020 MOVE AT, BY

1030 PRINT LS

1040 ENDPROC

1050 REM #################

1060 DEF PROCPEDMAN(CX)

1070 PROCEHARS

1090 GCOL 0,C%

1090 MOVE 870,750

1100 VOU 224,10,8,8,228,225 ,227,10,8,8,226

IIIO ENDPROC

1120 REM ****************

1130 DEF PROCCHARS

1140 VBU 23,224,0,0,0,60

,60,60,60,60

1150 VDU 23,225,126,255,255

,255,126,126,126,126

1160 VOU 23,226,126,102,102

.102,102,102,231,0

1170 VDU 23,227,0,0,128,192

,224,64,0,0

1180 YDU 23,228,0,0,1,3,7

,2,0,0

1190 VBU 23,255,255,255,255 , 255, 255, 255, 255, 255

1200 ENDPROC

1210 REM ****************

1220 DEF PROCEDXI

1230 VDU 7

1240 SCOL 0.0

1250 MOVE 200, 180

:MOVE 200.840

:PLOT 85,420,840

1260 MOVE 200, 180

aMOVE 420,180 :PLOT 85,420,840

1270 ENDPROC

1290 DEF PROCBOX2

1300 GCOL 0.0

1310 HOVE 750,570

: MOVE 750,840

:PLOT 85,1050,840 1320 MOVE 750,570

:MOVE 1050.570

:PLOT 85, 1050, 840 1330 ENDPROC

1340 REM **************

1350 DEF PROCEDX3

1360 GCDL 0.0

1370 HOVE 750,410

: MOVE 750.510

*PLOT B5,1050,510

THE BULL 第二 4 用语用







THE REPORT **康教教制 新 第 3 4** 7

THE REPORT OF THE PERSON OF TH

Pelican listing

Fre	om Page 19		PRINT "PELICAN CROSSING"		: #FX15,1 REPEAT	1740	######################################
1380	MOVE 750,410 :MDVE 1050,410	1540	MOVE 130,860 PRINT "************************************	1670		1750	DEF PROCNAIT(M%,G%) IF key_flag ENDPROC DL=0
	:PLOT 85,1050,510		COLOUR 1		H N		:REPEAT DL=DL+1
	ENOPROC	1570	PRINT TAB(1,10)*PRESS	1690	IF A#<>"X" AND A#<>""	1770	IF INKEY (-67) AND GY
1400	REN ****************		THE 'C' KEY		THEN VOU 4		AND NOT key_flag
	********		WHEN YOU		:CLS		YDU 4
	DEF PROCPIPS		ARE READY		: COLOUR 0		:CL5
1420			TO STOP TRAFF		PRINT "THE "X" KEY		:PRINT "YOU BLEN IT"
	:REPEAT P=P+1		IC"		I SAID"		: VDU 5
1430	SOUND 1,-15,200,1	1580	COLOUR 4		: PROCWAIT (900,0)		:key_flag=TRUE
1440	PROCCHECKX	1590	PRINT TAB(1,20) "PRESS		ELSE IF AS="X"		:FOR DL2=0 TO 200
1450	UNTIL P=25 OR key_flag=		THE 'X' KEY		THEN VOU 4		: NEXT
	TRUE		WHEN IT		:CLS	1780	UNTIL DL=WX OR key_flag
1460	ENDPROC		IS SAFE		:PRINT '*YOUR TIMING		ENDPROC
1470	REM ************************************		TO CROSS THE ROAD."		IS RIGHT*""IT IS SAFE TO CROSS.";	1800	REM ************************************
1480	DEF PROCINST	1600	PRINT TAB(2,29) *ANY KEY		:PROCWAIT(900,0)	1810	MODE 7
1490	COLOUR 135			1700	IF As=**	1820	REPORT
	:6COL 0,135	1610	AS=GETS		THEN VDU 4		:PRINT " In line ";
	:GCOL 0,0	1620	ENDPROC		:CLS		ERL
	:CLS	1630	ENDPROC REM ************************************		ELSE key_flag=TRUE	TH	is listing is included in
	:CLG		*********	1710	VBU 5		is month's cassette
1500	VDU 5	1640	DEF PROCCHECKI	1720	ENDPROC		pe offer. See order
1510	MOVE 130,900	1650	TIME =0	1730	REM ****************	fo	rm on Page 43.

BBC/ELECTRON ADVENTURES

"NEW" WOODLAND TERROR E7.48 (CASS) £10.50 (DISC)

The sequel to FIRIENWOOD, many years ago an intrepid adventurer embarked on a quest for the Golden Bird of Paradise. Although successful, our hero released a sinister force which now lurks within the enchanted wood. Your mission is to return the terror to its original resting place and restore peace to an unhappy land !!! This is a complete game, knowledge of Firienwood is not required.

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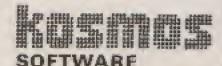
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Unit B

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BUGBLASIER

THE ACTION PACKED HIT REWRITTEN FOR ELECTRON

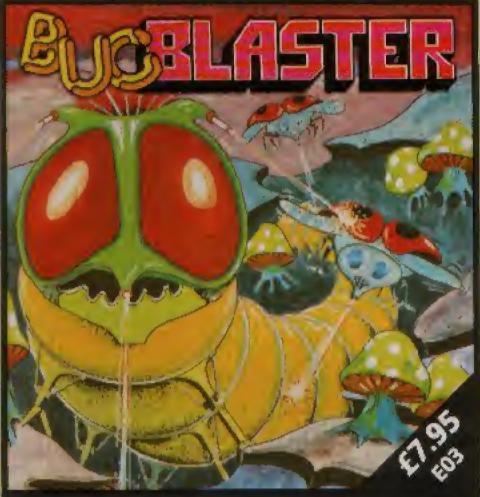
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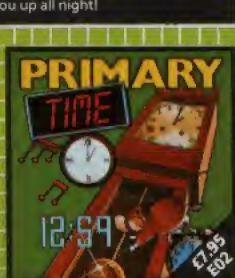


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BOOKSHELF

IF you're looking for just another book of games listings then "Take Off with the Electron and BBC Micro" will probably disappoint you.

However if you're after 11 interesting programs with lots of ideas on how to improve them then this is for you.

For listings are not just programs in their own right but

there was a fat writer called Andrew

And went out one day

PRESS ANY KEY TO CONTINUE

To roop in the hay

Who seldom said "Yes" and then "Can do"

That hopeless fat writer called Andrew

Take off with the Electron and BBC Micro

Granada Publishing

can be expanded. And the book tells you how to do this.

It starts with a concise but thorough description of elementary Basic and then goes on to the listings.

Each program has a chapter to itself and all chapters have the same structure.

You first read a description of what the listing does. Then comes the listing itself.

These are easy to read and the authors claim that "it is very unlikely that there are any mistakes in the listings". Brave words and, as far as I can tell, true ones.

The listings are useful and

fun. But the real value of the book, to my mind anyway, is in what follows them.

Each chapter has a wellannotated flow chart illustrating how it works. Then comes a line-by-line description of the program, very much like the ones you'll find in Electron. User.

When you've read how the program works there's a discussion of the keywords involved, nicely cross-referenced to the other listings.

Then comes a section describing one of the techniques used in the program, such as user defined characters and file handling.

These really add to the book's value.

Finally you reach the "Take off from here" section. This gives suggestions about modifying and improving the programs given.

I like the book. For the person who's taken his first faltering steps in Basic and would like to start more ambitious programming it's excellent.

The authors strike just the right level, not too difficult, not too simple, while keeping it all interesting.

Also the programs are nicely chosen. They range from the limerick writer (reproduced here) to a stunt car game via a music maker and a weather forecasting program.

All are short and easy to experiment with, and all of them are well explained.

Thoroughly recommended.

Nigel Peters

There was a poor toddler called Sarah Who seldow ate steak so such rarer And went out one night To put out the light That hopeless poor toddler called Sarah PRESS ANY KEY TO CONTINUE

Limerick illustration from Take off with the Electron and BBC Micro

Limerick listing

- 1 REM FROM TAKE OFF WITH
- 2 REM THE ELECTRON AND
- 3 REN BBC MICRO
- 4 REM BY DWEN AND
- S REM AUDREY BISHOP
- 6 REM GRANADA PUBLISHING
- 7 REN PRICE £5.95
- 8 REM USED WITH THANKS
- LO REM **LIMERICK**
- 20 MDDE 4
- 30 READ A
 - :DIM As(A)
- 40 FOR J=1 TO A
 - : READ As(3)
 - :NEXT J
- 50 READ B
 - :DIM BS(B)
- 60 FOR J=1 TO B
 - : READ B\$(J)
 - : NEXT J
- 70 READ C
 - : READ D
 - : DIM C\$(C), D\$(D,C)
- 80 FOR K=1 TO C
 - : READ C# (K)
- 90 FOR J=1 TO 0
 - : READ D*(J,K)
 - SWEKT
 - : NEXT
- 100 READ E
 - EREAD F
 - :DIM ER(E), FR(F,E)
- 110 FOR K=1 TO E
 - : READ ES(K)
- 120 FOR JEL TO F
 - :- READ F\$(3,K)
 - : NEXT
 - HEXT
- 130 READ 6
 - :DIM 6\$(6)
- 140 FOR J=1 TO 5
 - : READ 64(J)





This listing was produced using a special formatter which breaks one program line over several lines of listing. When entering a line don't press Return until you come to the next line number. Full details of the formatter are given on Page 4 of the February issue.

: NEXT 3 O READ H

:DIN H\$(H)

60 FOR J=1 TO H

: READ H\$(3)

: NEXT J

70 READ 1

:DIM [#(I)

BO FOR J=1 TO I

* READ [*(J)

: NEXT 3

PO REPEAT

DO CLS

IO PRINT TAB(16,5)"LIMERICK"

20 RA=RND(A) :R8=RND(3)

:RC=RND(C)

:RE=RND(E)

O PRINT TAB(0,10) There

mas a "A\$(RA)" "B\$(RS)

* talled *C\$(RC)

#O PRINT "Who "H\$(RND(H))

" "D\$ (RMD (D) , RC)

50 PRINT "And "I*(RNO(I))

" "E# (RE)

50 PRINT "To "F\$ (RND(F)

, REI

FO PRINT "That "G\$(RND(G))

" "A\$(RA)" "B\$(RB)" calle

d "C\$(RC)

BO PRINT TAB(8,30) PRESS

ANY KEY TO CONTINUE"

90 keys=GET\$

O UNTIL FALSE

60 DATA 3, poor, fat, rich

320 DATA 4, singer, writer , toddler, pop ster

330 DATA 3,2, Andrew, liked eating cheese fondue

340 DATA said "Yes"and them "Can do"

350 DATA Sarah, ate steak so much rarer

360 DATA thought no one would dame 'er

370 DATA Winny, liked wearing a picky

380 DATA looked horribly

skinny 390 DATA 2,3, one day, roop

in the hay

400 DATA join in the fray

410 DATA go out to play 420 DATA one night, have

a good fight.

430 DATA put out the light

440 DATA just be polite

450 DATA 2, silly, hopeless

460 BATA 2, always, seldom

470 DATA 2, went out, started

LIMERICK is one of 11 listings in 'Take Off With The Electron and BBC Micro" by Audrey and Owen Bishop. It is published by Granada Publishing, price £5.95. Our thanks to Granada for permission to reproduce the game.

ELECTRON USERS!

the line

Don't miss April's

THE MICRO USER

It's a feast of fascinating ideas and programs - our liveliest issue ever!

IN ITS FEATURE PACKED PAGES YOU'LL FIND

- * MICROGOLF: a compulsive simulation of a day on the golf course.
- * SOUND LIBRARY: create a whole collection of exciting sounds with this useful utility.
- * BEGINNERS: how to use MOD, DIV and RND effectively in your programs.
- MAGIC SQUARES: a number game that teaches simple addition as you play.

And, of course, most of the many programs featured in The Micro User can be easily modified for the Electron.

All in all, if you're an Electron User, it makes sense to also buy The Micro User.

> The April issue is now on sale at your newsagents.

NOW AVAILABLE ON THE ELECTRON D.A.C.C.'s SPRITE - GEN Runs in 4 colours Mode 5 **PRICE £9.95**

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Sprite-Ge

This amazing and revolutionary new piece of software, written for the BBC Model 8 by Dennis Ibbotson, represents the biggest step forward for BASIC programmers since the release of the BBC Micro itself. It allows you to create multi-coloured, fest moving SPRITES, controlled simply from your own BASIC program. Now you can write the kind of "Arcade Action" games you always drawned of writing before you discovered that BASIC can't achieve the speeds necessary. Until now, only experienced machine-code programmers could produce "Ghost Gobbling Monsters" and "Light Speed" speceraft. With SPRITE GRAPHICS all the creatures and objects you can immorane are at your commons, moving amountmy at any speed and in any arcadem you GRAPHICS all the creatures and objects you can imagine are at your command, moving amounts at any speed and in any exection you choose. Incredibilly, SPRITES can be created using ALL SIXTEEN logical colours — eight steady and eight fleshing. And as if that were not enough you animate your SPRITES with individual movements such as "a man who walks"; "a bird that flaps its wings", "invaders that pulse menacingly", the possibilities are endless! When you own the SPRITE GENERATOR package you have access to every sort of high-speed animation technique you need. Buying expensive machine-code games may become a thing of the past. Look at the following impressive list of features you can access from your own RASIC programs. features you can access from your own BASIC programs

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- There can be up to EIGHT different SPRITE DESIGNS active at one time, each of which dan have up to THREE "CLONES", (copies of the primary SPRITE but each with individual movement control).
- Ench SPRITE actually has TWO images which given slight differences will achieve the enimation effects when the two are alternated. Or, if you choose, give the two images totally different designs and you have created two SPRITES out of one, usable alternately. This technique can also be applied to the CLONES which means that all 32 SPRITES can be animated, multi-coloured, moving objects!!!
- Once you have completed the design of your SPRITES using the simple grid-based generator utility, they and the high speed machine-code routines that control their movement are secreted into RAM and the BASIC system is ready to accept your own program lines through which you can direct the SPRITES to appear, move, disappear or just remain stationary, with the simplest commands you
- SPRITES can be linked together in pairs or groups to produce large scale animation. Of course, if you wish they can be as small as a single pixel.
- Your own creations can move in front of each other with no loss of

SPRITE-GEN is supplied as a package containing:

- *** Sprite-Generator program

 ** Two ** Tast-action* demonst
- Two fast-action demonstration programs. Sprite-Gen control routines
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BEWARE IMITATIONS

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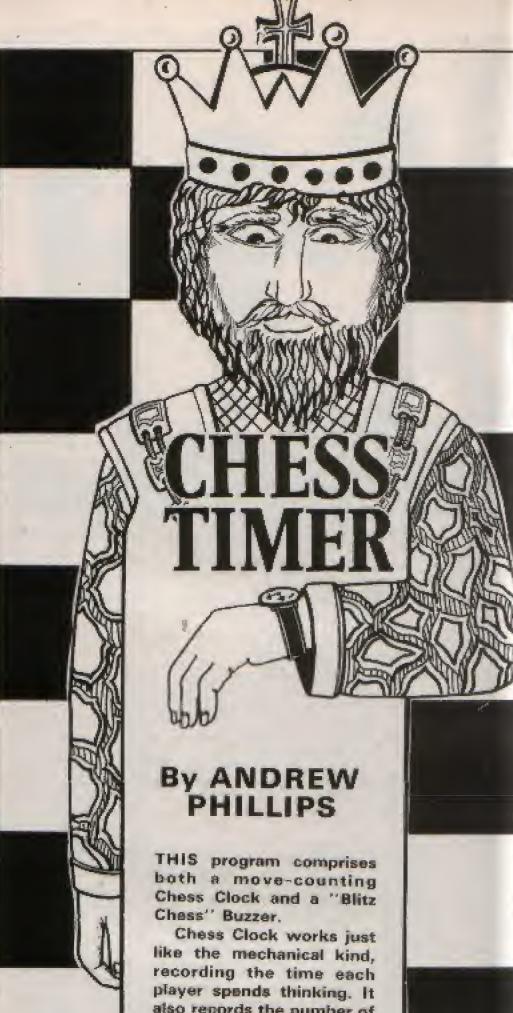
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also repords the number of moves made.

The program uses the computer's internal timer, thus ensuring a high degree of accuracy.

A number of move rates is available and an automatic alarm tells a player if he exceeds the time limit.

Move rates can easily be changed by altering the values at lines 290 to 340.

Pressing the space bar stops a player's clock and starts his opponent's. Pressing S stops both clocks for adjournment.

The "Blitz Chess" Buzzer sounds intermittently at one of the selected intervals, which can be changed by altering the values at lines 150 to 180.

There is no screen display, so the monitor can be switched off,

10 REM "CHESS TIMER" 20 REM A. Phillips 30 REM (C) ELECTRON USER 40 ON ERROR BOTO 470 50 MODE 5 : VDU 23;8202;0;0;0; 60 VDU 19,2,4;0;17,130 ,12 70 *FX16 80 *FX4.1 90 COLDUR 1 :PRINT TAB(4,3) "CHESS TIMER"TAB(4)STRING\$(1) " " " acolour 3 100 PRINT TAB(2,8) "SELECT FUNCTION: "''' 1 - Chess Clock"'' * 2 - 'Blitz Chess'*'' Buzzer" 110 ON INSTRU°12", GET# 1 6070 220 ,120 ELSE 110 120 CLS : COLOUR 1 :PRINT TAB(0,2) "'BLITE CHESS' BUZZER" STRING# (20, " ") :COLOUR 3 130 PRINT TAB(2,8) "SELECT INTERVAL: " ; - 5 seconds" " 2 - 10 seconds***** 3 - 15 seconds''' " 4 - 20 seconds" 140 DM INSTR("1234", SET\$) SOID 150 ,160 ,170 ,180 ELSE 140 150 Interval%=5 :6070 190 160 Interval %=10 :60TO 190 170 Interval %=15 :6070 190 180 Interval%=20 190 CLS :PRINT TAB(3,8) "Switch off TV" "then press SPACE BAR"'" to start buzzer" 200 PRINT TAB(1,25)*(Buzzer Interval = " "SPC (4);1 ntervalX; " seconds)" 210 REPEAT UNTIL SET# = in the :PRINT TAB(0,8) SPC (100) :PROChuzz(Interval%) 220 CLS

This listing was produced using a special formatter which breaks one program line over several lines of listing. When entering a line don't press Return until you come to the next line number. Full details of the formatter are given on Page 4 of the February issue.

: 87=2 :Rate%=0 :A11%=0 230 DIM TX(1),CX(1),SX(1) , MX(1); HX(1), KoveX(1) 240 ENVELOPE 1,0,0,0,0 ,0,0,0,126,-4,0,-1 ,126,100 250 COLOUR 1 :PRINT TAB(4,2) "CHESS CLUCK"TAB(4)STRING\$(11 : COLOUR 3 250 PRINT TAB(2.7) "SELECT MOVE RATE: " " 0 - No limit"'" 1 -20 moves/hour"'" 2 - 25 moves/hour " ' " 3 - 30 moves/hour" 270 PRINT TAB(1,18)*4 -All moves in"'" 15 minutes"'" 5 - All moves in"" 30 minutes" " & - All moves in"' 60 minutes" 280 ON INSTR("0123456" ,GET\$) 60T0 360 ,290 ,300 ,310 ,320 ,330 ,340 ELSE 280 290 RateX=20 :60T0 360 300 Rate%=25 :SOTO 350

310 Rate%=30 :6010 360 320 All X=15 :6010 350 :60T0 350 : COLDUR 1 :PRINT TAB(5,28) "Time limit:"' "ALL MOVES/"; Allx; " minutes" :60TO 370 : IF RateX()0 COLOUR 1 :PRINT TAB(1,28) "Move

330 All%=30

340 All%=60

350 CLS

360 CLS

rate: ";Rate%;"/hour" 370 PROCdraw(600) :PROCdraw(1232) 380 COLOUR 3 :PRINT TAB(3,4) "WHITE" TAB(2,8)"0: 0: 0" TAB(4,16)0 390 COLUUR O :PRINT TAB(13,4)*BLACK* TAB(12,B)"0: 0: 0" TAB(14,16)0 400 COLOUR I :PRINT TAB(8,14) "Moves" 410 PROCHait 420 SOUND 1.-10,93,5

430 REPEAT 440 PROCtime(0,1,8,3) 450 PROCtime(1,11,8,0) 460 UNTIL FALSE 470 ON ERROR OFF 480 IF ERR =17 RUN 490 MODE 7 : REPORT

:PRINT " at line ";ERL 500 81=10 510 *FX4 520 *FX12 530 END 550 DEF PROCdraw(xX) 560 600L 0,1

570 MOVE x 1,800 :DRAN x X . 700 580 DRAW x%-548,700 : DRAN x%-548,800

590 DRAW x 1,800 600 ENDPROC 620 DEF PROCWait 630 COLOUR 3

:PRINT TAB(3,21)*Press SPACE BAR"'" to start clock" 640 REPEAT UNTIL GET\$ =

450 PRINT TAB(0,21) SPC (60)

660 ENDPROC 680 DEF PROCtime(N%, X% , YX, PX)

690 TIME =TX(NX) 700 REPEAT 710 XX=1AKEY\$ (0) 720 IX=TIME

730 CX (NX)=2% NOD 100 740 \$%(N%)=(Z% DIV [00) 08 GOM 750 MX (NX) = (IX DIV 5000) MOD 60 760 HX (NX)=(2% DIV 360000) MOD 12 770 COLOUR FX :PRINT TAB(XX, YX)HX(NX) ": "MX (NX) ": "SX (NX) 780 IF All X=0 6070 800 790 IF Allx=M%(N%) OR ALLX=HX(NX) *60 PROCLOSE ELSE BIO 800 IF MoveX(NX)(RateX*HX(N %) PROClose 810 IF X\$="S" GR X\$="s" PROCHait :TIME =FWtime(CX(NX) ,SX(NX),MX(NX),HX(NX)) 820 UNTIL X *= " 830 SOUND 1,-10,77+NX+16 ,5 840 TX(NX)=FMtime(CX(NX) ,S%(N%),M%(N%),H%(N%)) 850 MayeX(NX)=MayeX(NX)+1 :PRINT TAB(XX+3, YX+B) Mo ver(NX) 860 ENDPROC 880 DEF FNtime(c%,s%,m% +17% 890 =c%+(s%*100)+(m%*4000)+ (h%#380000) 910 DEF PROClose 920 FOR 1%=170 2 :50UND 1,1,97,6 :SOUND 1,1,77,10 : NEXT IX 930 IF NX=0 P\$="WHITE" ELSE P#="BLACK" 940 PRINT TAB(5,21)P\$+ " LOSES"'" ON TIME DEFAULT"

950 REPEAT UNTIL FALSE 960 ENDPROC 980 DEF PROChuzz (Interval%) 990 REPEAT 1000 TX=TIME 1010 REPERT UNTIL TIME =TX+1 nterval7*100 1020 SOUND 1,-12,33,40 1030 UNTIL FALSE 1040 ENDPROC

This listing is included in this month's cassette tape offer. See order form on Page 43.

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THE COLUMN THAT TAKES A LOOK INSIDE THE LATEST RELEASES

Adventure into an arcade winner

Cyberton Mission Program Power

"ABSORBING", "Electritying", "Frustrating", "Addictive" are just a few of the adjectives I would use to describe Program Power's latest space game.

Load the program into your Electron and you are immediately conveyed into a danger-strewn world of spinners clones, cyberdroids and spooks. You may not be sure exactly what they are but you can be certain they're nesser

On the first level you are instructed to find a key which can be used to open a safe.

Doing this conveys you to higher levels, where more dangers await you.

However things are not as straightforward as just mendering round the screen and you find the key. Life in space — or at least in space games — is never that simple.

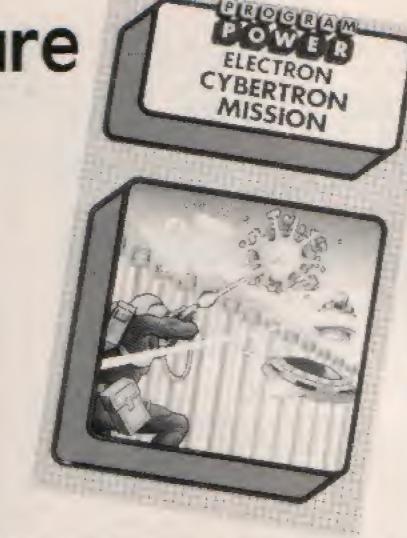
You'll need every one of your five lives as you beside your way through a series of maze-like rooms.

You score points each time you zap a spinner, and gain an extra life when, and it, you reach a pot of gold.

If you survive the first few batches of spinners you'll find that clones begin to block your way.

And after the clones come the cyberdroids – vacuum cleaner lookalikes with nesty dispositions.

Two points to note. First, watch out for the spooks. These little treasures will come and get you at every



possible opportunity. You've got to be alert and quick on the draw.

Second, you must have the key in order to open the safe to proceed to the higher levels.

The program is a cross between arcade-style action and an elementary adventure, combining the two perfectly.

It's exciting with plenty of variety, excellent graphics and interesting sound effects. You'll be a-mazed. And if you are anything like me, you won't be able to put your Electron down. A winner.

Paul West

Monster

Castle Frankenstein Epic Software

CASTLE Frankenstein is a text adventure originally written for the BBC Micro B and has now been converted to run on the Electron.

The plot centres around Frankenstein's monster.

Originally he was thought

to have perished in a fire 20 years ago. But now, because of unsolved murders in the area, there's a growing suspicion that he's alive and well and intent on vengeance.

The villagers have elected you to be their champion, and your task is to find and destroy the monster.

To help you the cassette comes with an insert which gives general information about the game.

Something I found rather strange about this insert was a claim that the tape was disc compatible. I suspect this was intended for the BBC rather than the Electron.

However it probably won't be long until the Electron has discs, so curiosity made me try putting the tape onto a friend's BBC Micro with discs.

I found you could not use it on disc without using a routine to move it down in memory.

Even then the save-game option would only work with cassette. I would be interested to know if the same is true of the BBC version.

On loading the program presents instructions and background information. Then begins one of the best all-round adventures I have ever seen for the Electron.

I will not reveal anything about the actual playing of the game. That's a pleasure I'll let you experience for yourself.

Whoever wrote this program has an extremely devious mind, and makes you work very hard for each piece of progress.

Yet, at the same time, he allows you to roam quite a distance before presenting you with puzzles to solve. This, I feel, is the proper way to write an adventure.

The beginner has lots of locations to explore to get the feel of the game, but the more experienced adventurer can go through them rapidly to reach the puzzles.

There were a few minor things I wasn't happy with. For instance, there's no on-screen indication of exits. But I've probably just got into lazy habits with other adventures.

The program itself responds very quickly to keyboard input, and the save-game facility — which is an absolute necessity — is very fast.

Overall, an extremely good adventure and excellent value for money,

Merlin

The frogs march on

Croaker Program Power

CROAKER is another version of that well known game in which suicidal frogs cross busy highways and then hop their way to safety across a river in order to reach a hole in the bank.

One day I am going to ask someone how come frogs drown if they fall into a river?

The program loads reliably and screen instructions appear while the main code is being loaded in.

The configuration of the



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From Page 27

keys is a little unusual - A and Z for up and down, while M and N control lateral movement.

However, they soon feel natural enough, although I would imagine that a joystick would improve matters.

The game's format is fairly standard, with five lanes of traffic travelling in alternate directions and at different speeds.

After a brief rest on the riverbank, there are then five more lanes of logs and turtles before safety is reached at one of the five holes.

When all are occupied bonus points are gained and the screens become more difficult. The cars move more quickly and are more frequent.

Things are even worse in

Electron User index of software reviews

Eylos Aztock A & F Softword	Jan 1994
Deaughtes & Reviews	
(Acoinsoti)	Oct 1383
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(Third Program)	Fet 1964

the river. Some of the turtles dive, and many logs turn out to be crocodiles with gaping jaws.

The game has little to make it stand out from its clones. But the graphics are quite presentable, with good use of colour. The key response is quick and positive.

screen starting at a very easy

level - my six-year-old son was able to do well at this initial level, although the crocodiles made him ditch many frogs into a watery grave.

Too often, a game starts with a level of difficulty that doesn't allow the young or inexperienced to achieve any success.

Here it is possible to gain

practice on the lower levels to help mount an attack on the author's claimed top score of 12,530.

This is a competent and addictive version, but without special features.

Probably the most used facility will be that which turns off the awful tune and reverts to the original sound effects.

Phil Taylor

Watch out, this caterpillar Caterpillar LJK Software is carnivorous

HAVE you ever felt the need to destroy a defenceless caterpillar? If you haven't so far, now's your chance.

In a variation of the popular arcade game, you control the black, movable weapon at the bottom end of a field of mushrooms.

You are hungry for points. The caterpillar is at the other end, hungry for you.

Hang on to your nerve as you watch it menacingly winding its way towards you, weaving between the mush-rooms,

As you move from left to right or up and down you fire at the caterpillar, blasting mushrooms out of the way, scoring points all the time.

When you hit the lengthy beasty, a segment is destroyed. If you hit it in the centre then it splits into two.

But it still comes towards you. Can you destroy it before it gets you?

While you're watching it come closer, you mustn't forget to fire at a scorpion which occasionally appears. A lot of points can be gained from hitting that particular undesirable.

Watch out, too, for a spider. He's hanging around the bottom of the screen and ready to grab you if you can't shoot or avoid him.



A nice little game, one that has everyone in the room wanting a go — while you're reluctant to let them. Graphics and sound effects are well up to standard.

Graham Parr



With the accent on action...

IF you're one of these shady characters who can go in a pub or amusement arcade and lose yourself for hours in a Space invaders or Galaxians game, then this should be right up your street.

There are fast and slow levels – and you take your pick according to how big-headed you feel. Then launch into the fray.

You are a lone, groundbased, tank-like vehicle fighting squadron after squadron of aircraft, all intent on sending you to the big electron cloud in the sky.

The skill lies in dodging the bombs and the descending bombers, who have no fear of Kamikazi A&F Software

ramming you.

At the same time you are trying to shoot them down. But to add insult to intended injury once you've annihilated one squadron another more challenging one is ready to take its place.

This is not the most original game in the world, but it is certainly well done.

The action is fast and furious with more than adequate sound and graphics.

If you are looking for a classic game to test your nerve and reactions this is for you.

Peter Gray

Are you fed up with shooting aliens, jumping barrels, or hopping over rivers? You are? Then try an adventure

AN adventure is a fantasy world which you, the hero. have to explore, usually with the object of finding treasure or rescuing princesses, and generally being a hero.

Kids stuff? Not at all.

The crafty programmer who's written the game doesn't want you to win too easily. So he makes it as hard as possible, which is often very hard indeed.

Believe me, when you've spent an hour trying to find a key to open a mysterious locked door only to find that the door is locked from the other side, you'll be ready to strangle that programmer.

An adventure is like a detective novel, full of clues, puzzles and red herrings. Your job is to sift the clues, solve the puzzles and, hopefully, recognise the red herrings.

What's more, because you're in a fantasy world, with its own natural laws, you can also have goblins, magic or even aliens to cope with.

Not quite that easy after all,

So where do these adventure games come from? They owe their origins to the Dungeons and Dragons craze that swept America in the mid-1970s.

Two maintrame programmers, Crowther and Woods, wrote a program called Colossal Cave, which simulated a D&D game, but had more emphasis on problem solving and less on fighting monsters.

This quickly achieved cult status among other programmers, and might have remained on mainframes but for an enterprising man called Scott Adams.

He adapted one of these

massive programs to a 16k TRS-80, published it, and the first adventure for a home micro, Adventureland, was released.

Since then many adventuses have been written. They can be split into two basic types - graphic and text.

Graphic adventures get their name more from the graphic action in them than the pictures on the screen, though they generally do have graphics of some kind.

They tend to simulate a D&D game very closely, in that you choose the type of role you wish to play, such as warrior, cleric, barbarian, wizard and so on.

On the basis of your choice you're assigned strengths and weaknesses which you exploit to achieve the objectives set in the adventure, like collecting treasure.

Since this treasure is almost invariably in the possession of some monster or other you spend most of your time fighting them. The result is that your progress often seems to depend more on luck than skill.

Text adventures earn their name because they originally consisted of text only, and were based on the same type of format as the original Crowther and Woods

Obviously there are now adventures with both text and graphics, so we can say that a strong sword arm is necessary for a graphics game and a lot of thought for a text game.

In this article I shall only be dealing with text adventures.

If they have their own history and are considered to be so good how come you

We all know about arcade games, and there are some brilliant versions available for the Electron.

But there are no adventure games in the arcades, so you either come across them by chance or somebody recommends them to you.

You either love them or hate them, and it's very hard to drag away the adventure fanatic from his machine long enough to talk about them.

You must have seen one of these adventure freaks. They're the ones who come to the computer club bleary-eyed from playing their latest game until three in the morning.

Yes, I know you thought he

you know.

What's so special about these adventure games?

I gave you an idea earlier of the object of them, so let's give you an example from that first Scott Adams game.

The aim is to collect and store 13 treasures. To get one of them you have to wake a sleeping dragon with some bees:

The bees have to be caught in an empty bottle - after you have first covered yourself in mud to stop them stinging you.

The bottle is full at first and has to be emptied over some lava to get another treasure.

However once you get to





the location where you empty the bottle you need a rug and a magic word to get out. To get the rug you need to rub the

lamp in another location. Not only that, you have to climb down a hole to get the means to light the lamp, which you find by chopping down a tree, after you've first climbed it to get the key which opens the door ...

Phew I Bit involved isn't?

But that's where the attraction lies, in solving the puzzles, progressing through the locations and getting that final message on the screen: "CONGRATULATIONS! YOU ARE A MASTER ADVEN-TURER!"

I know it must seem very

complicated, but adventures are totally logical. Admittedly that logic is sometimes very obscure but all the puzzles can be solved.

And there is no greater feeling than to solve a problem that has been stumping you for hours.

Now I've got you interested in them and you're all going to rush out and buy up the shop, let me give you the bad news: ALL adventures are very hard for ALL beginners.

The good news is that they are just like everything else. The more you do them, the better you get. I well remember my first game, and I can assure you it was not a very auspicious beginning.

and make a map based on

Some adventures have more than 200 locations, so it is a good idea to make a map of your travels anyway.

Another thing common to most adventures is ending up in the dark, often underground or in unlit rooms. Obviously you need to get a lamp or torch or at least some matches.

Should you come across one in your travels always check to see if you can light it first. Do you need matches or batteries - or oil if it's an'oil lamp?

If you do end up in PITCH DARKNESS, try and reverse the move you have just made. If that proves fatal, try and find the lamp and the means of lighting it before you re-visit that location.

If you've got the lamp, try LIGHT LAMP or ON or anything else you can think of before moving.

A few other things that might help you which should be obvious are to do with shovels, scenery and ropes.

If you find a shovel it's a good bet that you will have to DIG somewhere, either to find à treasure or to get an object that will help you somewhere else in the adventure.

Examine your surroundings. If you are in a forest, can you climb a tree? Or if you've got an axe, can you chop that tree down? Can you climb a wall, or

If you find a rope it's likely to be needed somewhere. either to climb something or perhaps to pull something.

An object that is too heavy to lift might be pulled if you TIE ROPE and PULL the object.

There are some general tips that are applicable to all adventures.

if the program allows you to save the game - that is, allows you to return to the location you have reached should something you do prove fatal then use it before you enter any suspicious places, or before trying something dan-

If something doesn't work, such as taking a bucket stuck in the mud by keying in TAKE BUCKET, then try doing it a couple of times.

These programmers are a crafty bunch, and sometimes make you do a thing a few times before you succeed.

Always read the room descriptions very carefully, sometimes clues are hidden here. Always EXAMINE everything.

I hope you now have an idea of what adventuring is all about. You never know, maybe we'll be seeing you staggering into the computer club with bleary eyes sometime.

Happy adventuring!

MEALIN







It's up to you. Remember, the Earth needs those minerals.

Good luck!

Hit

PROCEDURES

Tests for correct combination entered.

Booby Crash

Tests whether an asteroid has crashed into the ship or been collected. The score

Initialises characters and dimensions

Initial

instruct Displays the instructions.

Moveast Moves the asteroids. The main procedure

Plots an asteroid. Play

Plot

Displays the rocket exhaust. Calculates new positions and directions due Rocket

Rotate

Sets up the screen display for each new to rotation.

ship.

CHARACTER DEFINITIONS

Asteroids Spaceship Rocket exhaust

Character 240. Characters 241 to 248. Character 249. Character 250.

By ERIC H. CRISP

VARIABLES

Score. Combination input. A% A\$

Level of difficulty. As game progresses it C% increases the possible speed of the 0%

asteroids.

DX%(I%) Horizontal speed of an asteroid. DY%(1%) Vertical speed of an asteroid.

Finished flag. F%

Lives. G%

X%(1%)

Y%(1%)

Z%

Asteroid counter. 1%

Multiplication fector for rotation calcul-J%

K,L ations.

The three letter combination. Rotation direction of ship -1, 0 or 1. KEY\$

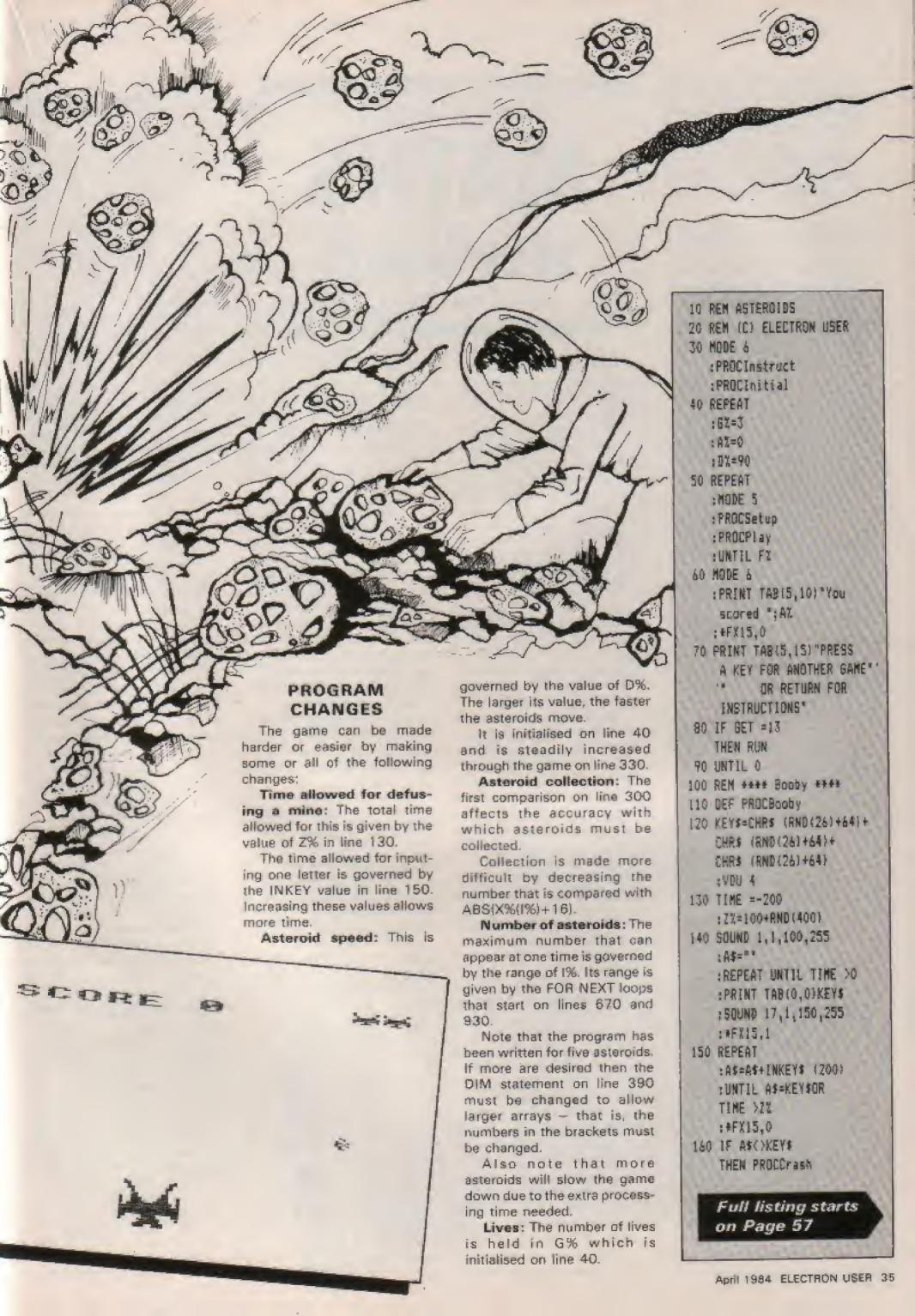
Ship's speed - 0 or 1. R% 5%

Asteroid type, 1 = red, 2 = green, 6 = mine. T%(1%)

X coordinate of an asteroid. Y coordinate of an asteroid.

Time for entering the three letter combination.

Setup



This maths workout is based on articles that originally appeared in The Micro User. Our thanks to our "blg brother" magazine for permission to use it.

WELCOME to the first in a series of articles in which we hope to take the mystery out of understanding the fundamentals of the Electron's workings.

All too often even competent Basic programmers tend to shy off such topics as binary coding, hexadecimal and assembly language because it seems too "mathematical".

This is a great pity, because the Electron is so constructed that a little knowledge in these fields allows you to take full advantage of its advanced facilities.

The mathematical aspects of the subject aren't at all deep. Certainly anyone who can follow Basic should be able to cope with this series.

If you feel that despite our best efforts we still haven't explained something fully enough, please write in and tell us. We'll try to rectify the situation in later articles.

First we are going to look at binary code.

This is a way of handling numbers essential to our understanding of what goes on inside a computer.

Binery is just a way of

MIKE BIBBY'S

MATHS workout

Exercises for the Electron

coding numbers in a way particularly sultable for computers. It's actually quite simple.

What often confuses beginners is the fact that the binary system codes numbers in a way that can look extremely like the way we normally code numbers.

For example, if you were presented with a number 100, you would probably decode it in your normal way and say it was "one hundred".

That, however, is just one way of interpreting it. If you decided to decode it as a binary number, you would interpret 100 in a completely different way and say it meant the number "four".

(Never mind exactly how you arrived at that conclusion for the moment.)

This is what often causes problems. People are so used to dealing with their numbers in the normal way that 100 is always "one hundred" to them. They can't make the shift necessary to decode it in binary as "four",

ous. Presented with 100, do you interpret it as "one hundred" or "four"?

Our rule will be, if you mean our usual way of dealing with numbers (the hundreds, tens and units you learnt at schoolor to put it more formally, the denary system) you write the

If you wish the number to be decoded as a binary number you put the symbol % in front of it. So 100 means "one hundred" while %100 means "four".

have a marker (%) to warn us that we have to decode the number in a special way as a binary number.

However before you decode you need a rule for decoding. So how do you get the number "four" from %100? What's the rule?

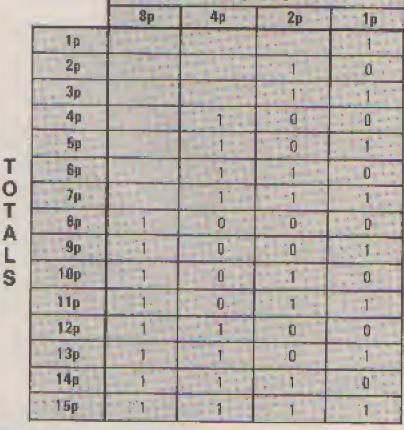
50p, 20p, 10p, 5p, 2p, and 1p (ignoring the half-pence). We can combine them to give any sum we wish.

Actually it is rather ambigu-

number in the normal way.

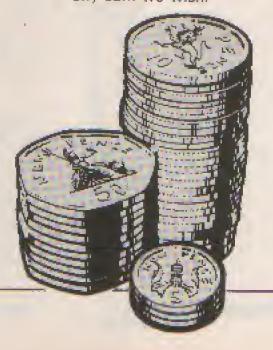
So far so good. We now

Let's take a detour for the moment, and think about the coins we use every day. Our currency, until recently, consisted of these coins:



COINS

Figure I



For example:

75p is 50p + 20p + 5p or 50p + 10p + 10p + 5p and so

We are all familiar with this. Often we use multiples of coins to make up a sum. For example, 5p can be 2p + 2p +

Using the same coin twice, though, often means that we end up carrying unnecessary amounts of change. I for one don't like doing that.

Sometimes, however, with our present coinage system we have to use the same coin twice to obtain certain sums.

You cannot, for instance, make up the sum of 4p without doubling up coins. To avoid repeating coins we would have to invent a 4p coin.

Let's do that. In fact, let's invent a coinage system where you never have to use the same coin twice.

First of all we would need a 1p coin and, of course, a 2p coin. We cannot use 1p + 1p for 2p because it breaks the rulet

Now 3p can be made up of 1p + 2p. But for 4p we'll have to invent a 4p coin.

Equipped with that we can make 5p (4p + 1p), 6p (4p +2p), and 7p (4p + 2p + 1p).

In obtaining 7p we used all our available coins, so now we have to invent an 8p coin.

If you work it out - and I suggest you have a go - you will find that with the coins you have at your disposal (8p. 4p, 2p, 1p) you can make any sum up to 15p. Then you would have to invent a new coin, 16p.

Notice how the coins we have created have doubled in value: 1p, 2p, 4p, 8p, 16p. No prizes for guessing what the next one is.

Let's summarise our results in a table (Figure I). Here I have used the columns to show the coins available and the rows to show how the various totals are made up.

A 1 in a particular column means that we use that column's coin, and 0 means that we don't use it.

Look at the row for 5p. lt has 101 on it.

According to our rule this means we pick out the coins 4p and 1p (and NOT 2p) to make up the 5p total:

4p 2p 10 4p + 1p = 5p

Denary Value	Column 8	4	or Bit Value	1	Binary Value
1 1	3 7 8			1	%1
. 2			1	Đ	%10
3	T ₀		1	1	%11
. 4		1	.0	ů.	%100
5		1	0	1	%101
6		1	1	0	%110
• 17			1	1	%111
В	1	Ö	0	0	%1000
s 9	1	-0	0	1	%1001
10	1	D	1	D	%1010
11	1	Çi.	1	1	%1011
12	1	T	D	0	%1100
13	1	. 1	0	1	%1101
14	1	$\tilde{\mathbb{V}}_{i}$	1	0	%1110
15	1	T	1	1	%1111

Figure II

Now let's get back to computers by dropping all this talk about coins and redraw Figure I to show the same information but without referring to money – just numbers.

Figure II is the new table. As you can see, there is little change.

We can use this table to encode numbers in general, not just coins. We call this method of encoding the binary system.

Remember, to show that we mean a binary number we precede it with %.

So if you see, for example, %101 means:

That is, we add together the values of the columns containing 1. Look at row 5 of the

table to check it.

Similarly, %1101 would mean 13 in the denary system since:

By now you should be able to work out for yourself why %100 represents four.

From the table, or by using the addition method I've just illustrated, see if you can decode the denary values of the following binary numbers:

%1001 % 101 % 11 %1101 % 111

You can use the program accompanying this article to check your results.

You've probably noticed by now that in the binary system you only use two symbols, Q and 1, to encode numbers. Hence binary, bi--for two, as in bicycle.

You can encode any number that you want in binary. Just use more columns (or "bits" as we say in computer jargon), remembering that each new bit is worth double the preceding bit.

However it does get terribly cumbersome. For example, 100 (denary) encoded in binary is %1100100 since:

64 32 16 8 4 2 1 % 1 1 0 0 1 0 0 → 64+32+4=100

It is much easier to handle the number in our normal system.

To a computer this presents no problem. The fact that binary only uses two symbols is a bonus because you can represent numbers with a sequence of "switches".

Switches are what we call "two state". They're either ON or OFF.

If we have a sequence of four switches together we can encode numbers by having them either ON or OFF.

We could use ON to mean a 1, and OFF to mean a 0 in a particular column:

8 4 2 1 ON OFF ON ON → %1011=11

Fach of these "switches" represents a bit, and a computer memory is full of bits.

The 6502, which is the microprocessor at the heart of the Electron, deals with 524,288 of them.

To make things simpler, the 6502 handles the bits in groups of eight bits at a time — the group of eight being called a byte.

With this type of organisation the largest number you can store in a byte is 255 since:

128 64 32 16 8 4 2 1 % 1 1 1 1 1 1 1 1 → 128+64+32+16+8+ 4+2+1=255

Of course the computer can handle larger numbers (and not just whole numbers) but to do so it must use more than one byte.

Converting a byte from binary to denary is fairly straightforward. Simply write it down under the appropriate column (or bit) values and add together the value of all the columns in which a 1 occurs.

For example, given %10010101 you translate as follows:

128 64 32 16 8 4 2 1 % 1 0 0 1 0 1 0 1 → 128+16+4+1=149

Going from denary to binary is not at all difficult, but it is rather hard to put into words.

You do it by subtracting from the number you want to encode the value of each column in turn, starting with the highest (i.e. 128, 64, 32 and so on).

If you can subtract a particular column value you put a 1 in that column and continue to subtract the next lower column value from the remainder.

If you cannot manage the subtraction you put a 0 in that column and try to repeat the subtraction with the next lower column number.

So, starting with the highest column number (128 in our case), you: REPEAT

1. Attempt to subtract the

149		128	64	32	18	B	4.	, 2:	1	
-128	128 goes - set to 1	1		ad-			100			
<u>-128</u>	, 64,32 can't go - set to 0		0	0		457)	5.70			
_16	16 goes - set it to 1	100	4	1	1	0 t t t t t t t t t t t t t t t t t t t		7 F.		
5	8 can't go — set to D					0	100	200	6.70	
4	4 goes - set to 1	1 7 7					1			
1	2 can't go - set to D		1	-				0		
1	1 goes - set to 1					4 100	200		1	
0		% 1	0	O	1	0	1	0	110	

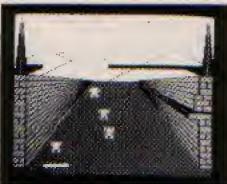
Figure III

DYNABYTE

EXPLOSIVE.



Lemming Syndrome



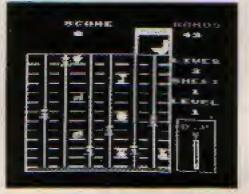
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From Page 37

relevant column number (highest first).

2. IF you succeed then put a 1 in that column number and continue to subtract other columns from the remainder. ELSE put a 0 in that column.

UNTIL all eight columns are covered.

Figure III should make it. clearer.

In practice, when faced with encoding a number from denary to binary I tend to do it in my head, seeing which column values will add together to make the sum required, starting with the highest first.

For example, if I were to encode 161 in binary I would say, "Well, I can use 128, so that leaves me 33 to find, 33 can be made up of 32 and 1 so that does it: 128+32+1=161.

So I encode it as:

128 64 32 16 3 4 2 1 % 1 0 1 0 0 0 0 1 =%10100001

After a while you'll find this

way quite simple.

To finish off, I'll leave you with a program to print out the binary value of a number between 0 and 255 (i.e. that

can be stored in one byte).

Try it with various values and see if you can accept the results.

The program itself uses one

or two ideas, such as AND, that may not be too familiar to you as yet.

Worry not. Watch these pages.

20 REM * ELECTRON USER

40 MODE 6

50 ON ERROR GOTO 230

ad REPEAT

70 *FX15.1

80 CLS

90 9%=4

100 REPEAT

110 PRINT TAB(0,5) CHR\$ (130)

120 PRINT TAB(1,5); STRING\$(15, " ")

130 INPUT TAB(1,5) "Denary

"denary%

140 ORTEL denary2>=0
AND denary2<256

150 PRINT TAB(1,12) "X"

180 FOR 1%= 7 TO 0

STEP -1

170 PRINT TABESO-4#1%

,10)2-1%

180 PRINT TAB(30-4*1% ,12)(2^1% AND denary%)/

2^1%

190 MEXT

200 PRINT TAB(0,20);

CHR# (132) CHR# (157)

CHR# (131) "SPACE TO

CONTINUE, ESCAPE TO

END

210 REPEAT UNTIL INKEY (-99)

220 UNTIL FALSE

230 END |

This listing was produced using a

special formatter which breaks

one program line over several lines

of listing. When entering a line

don't press Return until you come

to the next line number. Full

details of the formatter is given on

Page 4 of the February issue.

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Why not use the program to produce your own friezes? You could make a fortune designing your own wallpaper.

All you have to do is to decide on the figure you want repeating and note down the numbers for the VDU 23 statements of all the user defined characters used.

It's just as we do in our

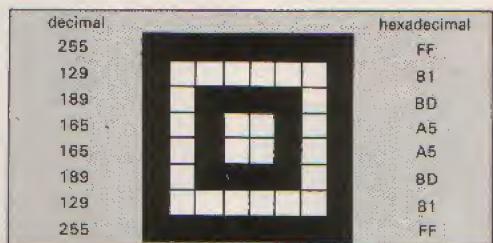


Figure I: Decimal and hexadecimal numbers for the same character

monthly Casting Agency.

The complicated bit is that the program uses 25 user defined characters to make up one figure. It arranges them into one block, using the methods shown in Casting Agency in the November issue of Electron User.

It then prints this block over

210 DATA 00000000000000000

215 DATA 7F00003C02010101

220 DATA 0080404040414343

225 DATA 030F1F3FFFFFFFE

230 DATA E0E0C8C898183870

235 DATA 0080909090908887

240 BATA 107272F28E8E7001

245 DATA 47470F1E1801C3E0

250 DATA F8E1071FFFFFFF7C

255 DATA E0E0E0C0C0800000

260 BATA 403F0000000000307

265 DATA 03C3011838F0F2E6

270 DATA ESECCCICFO78070E

275 BATA 0000F00804024140

290 DATA 00000000000000000

285 DATA OFOF 1F3F7F7FFFE

290 DATA CECFCF9F9F3F3E7E

295 DATA 2023202010080402

300 DATA COB070640C180706

305 BATA 0000000000000000

310 DATA FBF1C30F3E000000

315 BATA FEF8E00000000000

320 DATA 0000000000000000

325 BATA 00010000000000000

330 DATA E000108400100000

205 END

and over again to produce the frieze.

Let's try out a simple pattern. Rather than make up a figure out of 25 user defined characters, we'll just use the same character 25 times over to make up the figure.

Suppose we use the character shown in Figure I. We would define it, just like any other Casting Agency character, with a VDU23 statement. In this case:

VDU23,224,255,129,189, 165, 165, 189, 129, 255

We use this 25 times to create one block. If I was creating a more complicated block, each user defined character would probably be different.

This would mean some planning on a piece of paper beforehand.

Happily the program saves us a lot of time and trouble because it will do all the arranging for us.

What we have to do is put the last eight numbers of the VDU statement into the DATA statements at the end of the program.

Normally we write the numbers after the VDU23,224 in ordinary decimal figures.

However this program makes use of hexadecimal numbers - that is, numbers to the base 16.

Don't worry too much about these. We will be covering hexadecimal numbers in a future Maths Workout feature in Electron User.

Use Program II to change

I REM FRIEZE:

2 REM BY ALLEN PLUME

3 REM (C) ELECTRON USER

THIS program produces a

frieze, a repeated pattern

like the one pictured here.

A frieze in its most basic

form is simple to produce

on an Electron, as it is

merely the repeated draw-

probably the most difficult part

to understand. Here it is made

up of 25 user defined charac-

ters, listed in the DATA

statements at the end of the

be able to produce your own

By altering them, you will

Creating the figure is

ing of one figure.

5 *FV0.1

program.

friezes.

10 HODE 4

15 FOR C%=224 TO 248

20 VOU 23, CX

25 READ AS

30 FOR JX=1 TO 15 STEP 2

35 VDU EVAL ("&"+MID#(A#

(32,2))

40 NEXT

45 NEXT

50 VDU 5

55 BS\$=CHR\$ 10+STRING\$(5

CHR\$ 8

60 As=""

65 FOR JX=224 TO 244

STEP 5

70 FOR 11=J1 TO J1+4

75 As=As+CHR\$ IX

BOONEXT

85 As=As+BS\$

90 NEXT

95 FOR YX=192 TO 832

STEP 320

100 FOR XX=0 TO 1240

STEP 150

105 NOVE XX, YX

110 PRINT AS

Program 1

Page 4 of the February issue.

115 NEXT

120 NEXT

125 FOR YX=352 TO 992

145 NEXT

180 VDU 24,100;1000;1180;1023

This listing was produced using a special formatter which breaks one program line over several lines. of listing. When entering a line don't press Return until you come to the next line number. Full details of the formatter is given on

STEP 320

130 FOR XX=-80 TO 1140

STEP \$60

135 NOVE XX, YX

140 PRINT AS

150 NEXT

116

:DRAW 100,1023

: DRAW 1180, 1023

200 VDU 30

155 GCOL 0,128

160 VIII 24;0;0;100;1023;16

165 VDU 24, 1180; 0; 1279; 1023; 16

170 GCOL 0,129

175 VDU 24,100;0;1180;24;16

185 VOU 26

190 MOVE 100,17

195 MOVE 1180, 17

This listing is included in this month's cassette tape offer. See order form on Page 43.

each of the last eight figures into hexadecimal. You then put these odd looking numbers into the relevant DATA statements, one after the other, with no commas.

We will come to this after we've seen how each of the 25 DATA statements at the end of the program correspond to each of the 25 characters that make up the blocks of the frieze.

But first, key in Program II:

- LO REM PROGRAM II
- 20 REPEAT
- 30 PRINT "ENTER THE NORMAL NUMBER"
- 40 INPUT derival
- 50 PRINT*THE MENADECIMAL
 - 15 "; "decimal
- 60 UNTIL FALSE

Figure II shows now one of these blocks, or figures, is made up of 25 user defined characters.

The top left character of the block - numbered 1 in the diagram - has its VDU data, which are the last eight numbers converted to hexadecimal, stored after the DATA of line 210.

The next, number 2, has its VDU23 numbers stored in line 215 ... and so on until the figures for character 25 are stored in line 330,

In my case, I just want my simple pattern repeated 25

If you still cannot see how the characters fit together to make the blocks, try changing the figures in the DATA statements and see what

The last eight numbers of the VDU23,224 making up my character have been converted into hexadecimal, using Program II, and placed in the DATA statements, one after the other without commas.

The 255 becomes FF, 129 becomes 81 and so on. This means that:

255,129,189,165, 165,189,129,255

becomes:

FF81BDA5A5BD81FF

1	2	3	4	5
line	line	line	line	line
210	215	220	225	230
6	7	8	9	10
line	line	Ilne	line	line
235	240	245	250	255
11	12	13	14	15
line	line	line	line	line
260	265	270	275	280
16	17	.18	19	20
line	line	line	line	line

295

23

line

320

300

24

line

325

Figure II: One block of 25 characters and the lines where their data is stored

290

22

line

315

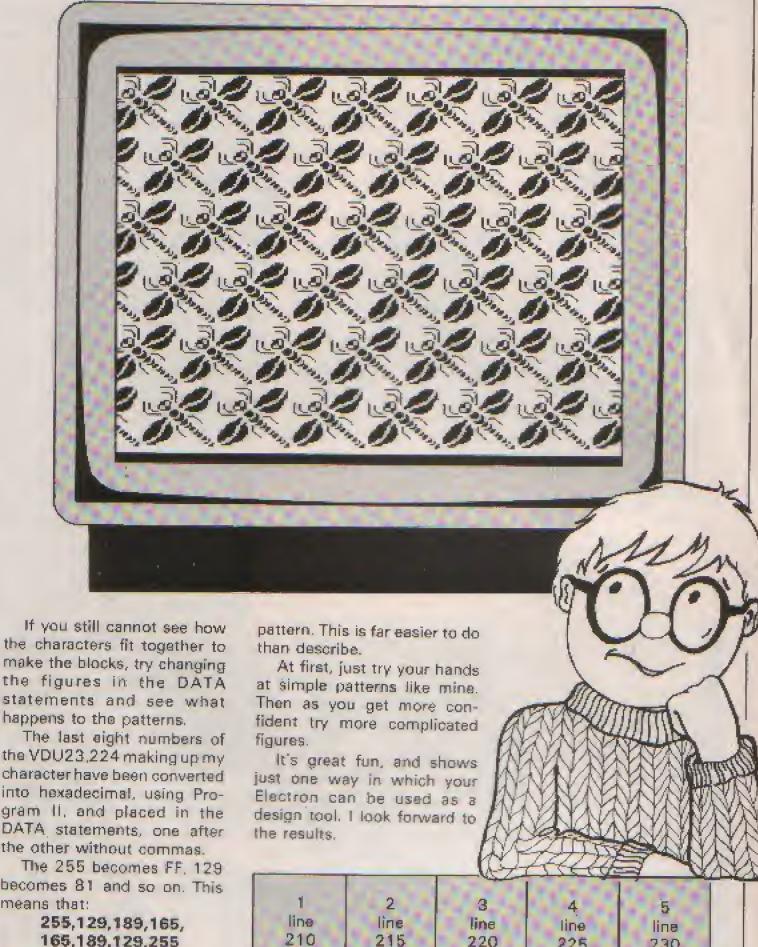
285

21

line

310

DATA statements are all the same, as shown in this listing:	Now when I run the main program with these altered DATA lines I get a brand new
210 DATAFFS180ASAS8081FF 215 DATAFFS180ASAS8081FF	275 DATAFF818DASA58D81FF 280 DATAFF818DASA58D81FF
220 DATAFF818DASAS8D81FF 225 DATAFF818DASAS8D81FF	285 DATAFF81BDA5A5BDB1FF 290 DATAFF81BDA5A5BDB1FF
230 DATAFF8180ASASB081FF 235 DATAFF8180ASASB081FF	295 DATAFF81BDA5A5BDB1FF 300 DATAFF81BDA5A5BDB1FF
240 BATAFF8180A5A58081FF 245 BATAFF8180A5A58081FF	305 DATAFFB1BDA5A5BD81FF
250 DATAFF818DA5A58881FF	310 DATAFF81BDA5A5BD81FF 315 DATAFF81BDA5A5BD81FF
255 DATAFF8180A5A58081FF 260 DATAFF8180A5A58081FF	320 DATAFF818DA5A58D81FF 325 DATAFF818DA5A58D81FF
265 DATAFF818DASASBORIFF 270 DATAFF818DASAS8D81FF	330 DATAFF8180A5A5B081FF

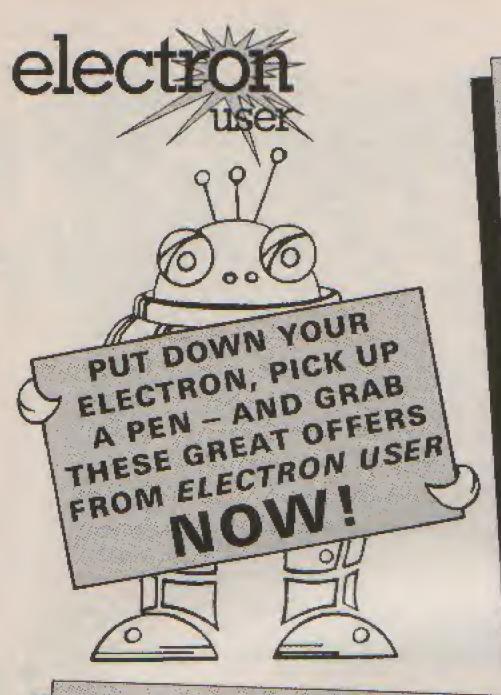


305

25

line

330



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If you thought your micro had more to do with the future than the past, let MIKE MAHON show you how to conquer those ancient Roman numerals

YOU may be a whizz at decimal arithmetic or can think in hexadecimal and binary. But how quickly did you work out the title of this article?

The program listing given here will let you do just that convert Roman numerals to decimal and vice-versa. But more about the program later.

The Romans used a sevencharacter - septal - system for numeration. These characters and their decimal equivalents are shown in Table I.

Initially the Romans themselves used up to four characters of any one type to make up a number, such as IIII for 4.

But modern usage is based on the subtractive system whereby only three characters of a type are used together and then one is subtracted from the next higher value, like III for 3 and IV for 4. We will be using the subtractive system here.

Did you know that the largest number you can have using this system is 3999? The program described here works in whole numbers integers - from 1 to 3999.

Do you know that the longest roman numeral is 15 characters long? The answer to this, and some other frequently used figures, is

given in Table II.

The program is written in BBC Basic and may be said to be structured in that it is made up of separate modules.

It does not use GOTO or GOSUB or refer to line numbers within it, and the main variables and procedures are reasonably self explanatory.

This should enable the user to readily modify the program for his or her own needs, such as by adding routines for testing and scoring pupils or for printouts.

The main program occupies lines 100-200, most of which is concerned with precautionary features such as switching off the cassette motor and printer, if available, and disabling the auto repeat, cursor editing and copy key functions.

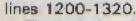
It also forces the program to re-run if either the Break or Escape keys are pressed.

The only way to exit the program and reset all the functions to normal is to press the Control and Break keys together.

The rest of the program is in the procedures, which are listed and explained in Table HE.

The main algorithm - the programmed formula - for decimal to Roman conversion is in line 730. This steps through the decimal number and picks out the appropriate roman characters from the data table fed into the array roman\$.

The other algorithm, for Roman to decimal conversion, is a little longer and resides in



The majority of the program is concerned with - as usual trapping user errors and presenting information on the screen.

Most problems are catered for and only valid inputs are allowed. It is, however, essential to use the Electron with the Caps lock ON and the Shift lock OFF as at switch on. It is left as an exercise to the reader to find a way around these problems.

Also, what about adding a routine of your own for converting hexadecimal to Roman numerals using the inbuilt facilities of your micro.

Oh - the title of this article? 1984 of course!

Roman C X D Decimal 10 50 100 500 1000.

Table I

Decimal	Comment	Roman
18	Smallest	I
3999	Largest	MMMCMXCIX
3888	Longest	MMMDCCCLXXXVIII
1066	Battle of Hastings	MLXVI
1969	Men on the Moon	MCMLXIX
1983	Birth of Micro User & Electron User	MCMLXXXIII
2000	The next century	MM

Table II

-	PROCEDURES
PROCdata	Fills array roman\$ with all the valid
	Roman numeral character groups in
	units, tens, hundreds and thousands.
PROCtitle	Displays the program title and lists
7	the three options available.
PROCdecinput	Receives decimal input for conver-
	sion to a Roman numeral.
PROCdecanelyse	Converts decimal input dec to
	equivalent Roman numeral
	romnum\$.
PROCromaninput	Receives your Roman numeral RN\$
	for conversion to a decimal number.
PROCromananalyse	Converts a Roman numeral to a
	decimal number.
PROClist	Lists decimal and Roman numbers in
	the range specified by start and
	finish.
PROCcheckinput	Allows only the 10 valid decimal and
	7 valid Roman characters to be
Company of the Compan	entered.
PROCinvalid	Tells you that your entry is not valid,
	for example not in the range 1 to
	3999.
PROCreturn	Displays message to terminate your
	input.
PROCpause	Waits for you to have another go to
	change your option.

Table III

100 REM ROMAN NUMERALS 1200 DEF PROCromananalyse This listing was produced using a special 1210 L=LEN (RN\$): 110 REM Mike Mahon formatter which breaks one program line over : DEC=0 120 REM (C) ELECTRON USER several lines of listing. When entering a line don't 1220 N=0 130 VDU 3 press Return until you come to the next line number. Full details of the formatter are given on REPEAT : #NOTOR O Page 4 of the February issue. : N=N+1 135 FX4 . I : IF MID#(RN#,L.I)= 140 *KEYTO OLDEN RUNIM HIRE 145 *FX11,0 THEN DEC=DEC+1 150 MODE 6 : 1 = 1 - 1 160 ON ERROR RUN :UNTIL L=0 OR N=3 170 BIH roman\$ (4,10) :roschar*="" 920 REPEAT 1230 IF NID# (RN# L, 1) = "V" 180 PROCeata :romnum#="" :key=GET 190 PROCtitle 720 FOR rowX= LEN (decs) :UNTIL key=13 THEN DEC=BEC+5 200 END 930 ENDPROC TO I STEP -- 1 1-1-1 499 799 : IF MIDS (RNS, L, S)= 725 pos=pos+4 500 DEF PROCdata 1000 DEF PROClist 730 roachar\$=roman\$(rom% 510 DATA 0,1,11,111,11 1005 okay\$="1234567890" THEN DEC-DEC-1 II, HIEV, HIV, IV, V. , VAL (MID\$1dec\$, pos :maxlen=4 :1=1-1 520 DATA O, X, XX, XXX, XX , D. Mariera, and heavy 1010 CLS 735 IF ronchar #= "0" L.LX,LXX,LXXX, IC 1240 N=0 : PROCreturn THEN roachars= ** 530 DATA 0,0,00,000.000 REPEAT :PRINT TAB(2,2) Eater 740 romnum\$=romnum\$+romchar\$,D,DC,BCC,8888,63 : NEW + L range (decimal): START ; IF MID# (RN#, L, 1) = 750 NEXT 540 DATA O.M. HK. MET. I 760 ENDPROC 0,0,0,0,0 :PROCcheckinaut THEN BEC-DEC+10. 799 550 FOR row%=1. TO 4 istart=VAL (string\$) 800 DEF PROCromaninput : L=1-1 :FOR COLUMN O TO F PRINT TAB (25,3) FINISH 810 okays="IVXLCOM" : IF MIDS (RNS, L, F)= FREAD romans (rom) ··· [[] [] [] [] [] :daxlen=i5 .col%l : PROScheckinput 820 CLS THEN DEC-BEC-1 : NEXT ifinish=VAL (string*) : L#L-1 PHEXT :PROCreturn 1020 IF start() OR start>399 (PRINT TAB(2,5) "Enter : N=N-1 560 ENDPROD Roman numeral * * * * * * 9 OR finish(1 OR finish 599 1250 UNTIL L=0 08 N=3 >3999 OR finish(start :PROScheckinput 600 DEF PRDEdeciment 1260 3F MID\${RN\$,L,1)="L" :RN\$=string\$ 605 okay#="1234567890" THEN PROCInvalid 850 PROCromananalyse fmaxlen=4 THEN DEC=DEC+50 :PROClist SEO IF DECKI OR DEC>3999 610 CLS :1=1-1 1030 start=INT (start) :PROCretera : IF MIDs (8Ns, L, 1) = :finish=INT (finish) THEN PROCinvalid MY H PRENT TABLE, 5) "Enter 1035 RF finish-start >15 : PROCromaningut, THEN BEC-DEC-10. Decimal number ": 865 dec=DEC :4=1-1 :PROCchecksagut THEN VOU (4 : PROEdecanalyse :dec=VAL ((strings)) 1270 N=0 :PRINT TAB(1,22) Press : IF RM\$ () rounum# 620 IF dec <1 08 dec 0799 REPEAT SHIFT to Scroll page GR dec()[NT (dec) : N=N+L 19/9/19 THEM PROCENYALID :IF MID# (RN#, L, 1) = 1040 VDU 28,5,20,38,5 :PROCrossainput HEU ... THEN PROCERVALES :PROCEECI nout ero PRINT TAB(8,6) Decimal 1050 FOR dec=start TO finish THEN DEC-BEC+100 :PROCdecanalyse munder *:DEC 630 PROCdecanal vise : = - : 1060 PRINT TAB(5):dec: SEC PROCeasese. : IF MID#(AN#, E, 1) = 640 PRINT TABLE, BERROOM TAB(15); roanua\$:FFCCroweninout нув whuseral "trosquat 1070 NEXT 890 ENDPRED THEN DEC-BES-10 650 PROCpause 1080 VBU 26 877 : PROCdecinput :E=L-1 " 999 DEF PROCesuse : VDU 15 A HEM-1 SAO ENDPROC 1090 PROCpause 905 *FX15.0 1280 UNTIL L=0 OR M=3 699 PIG PRINT TRB(1,22) "Press :PROClist 1290 IF MID#(RN#, L, 1) = "D" 700 DEF PROSdecanalyse 1100 ENDPROC ESCAPE for MENU RETUR 710 dec\$=\$TR\$ (dec) 1179 N for more" :pos=0

Roman Numerals listing

From Page 45

THEN DEC=DEC+500 :L=L-1 : IF MIDS (RMS, L. 1) = BCH THEN DEC-DEC-100 : L=L-E 1300 N=0 : REPEAT : N=N+1 : IF MIDS(RNS,L,1)= THEN DEC=DEC+1000 : LEL-1 : IF MIDSERNS, L. I }= THEN DEC-DEC-100 : L=L-1. : N=N-1 E310 UNTEL L'=0 DR N=3

1320 ENDPROC

1999 2000 DEF PROCtitle 2010 CLS 2015 VOU 19,1,3,0,0,0 2020 PRINT TAB(10.5)" ROMAN NUNERALS" 2040 PRINT TAB(8,10)"1 Decimal to Rosen" 2050 PRINT TAB(8.(2)"2 Roman to Decimal" 2060 PRINT TAB(8.14) "3 Listing of Roman" 2070 VBU 19,1,2,0,0,6 :PRINT TAB(0,17)* Select appropriate option "; 2080 REPEAT :option\$=GET\$:UNTIL option \$= "1" OR option#="2" OR option\$="3" 2085 VDU 19,1,7,0,0,0

2090 IF option#="1"

THEN PROCdecinput 2100 (F option\$="2" THEN PROCromaningut 2110 IF option\$="3" THEN PROCEEST 2130 ENDPROC 2199 2200 DEF PROCinvalid 2210 VDU 7,7 :CLS : VDU 19,1,11,0,0,0,0 :PRINT TAB(14,10) "INVAL ID ENTRY" 2220 TIME =0 REPEAT :UNTIL TIME =200 2230 VDU 20 : ENDPROC 2299 2300 DEF PROCcheckinput 2315 string\$="" REPEAT

2320 REPEAT

:key\$=6E7\$:UNTIL INSTRICKEYS ,kev\$) 00 OR kev\$= CHR# (13) 2330 PRINT key≸; : (F keys () CHR\$ (13) THEM strings-strings-ke V\$ 2340 UNTIL key\$= CHR\$ (13) OR LEN (string\$) >= maxlen 2350 ENDPROC 2399 2400 DEF PROCreturn 2410 PRINT TAB(1,22) Press RETURN to input entry" : ENDPROC

This listing is included in this month's cassette tape offer. See order form on Page 43,

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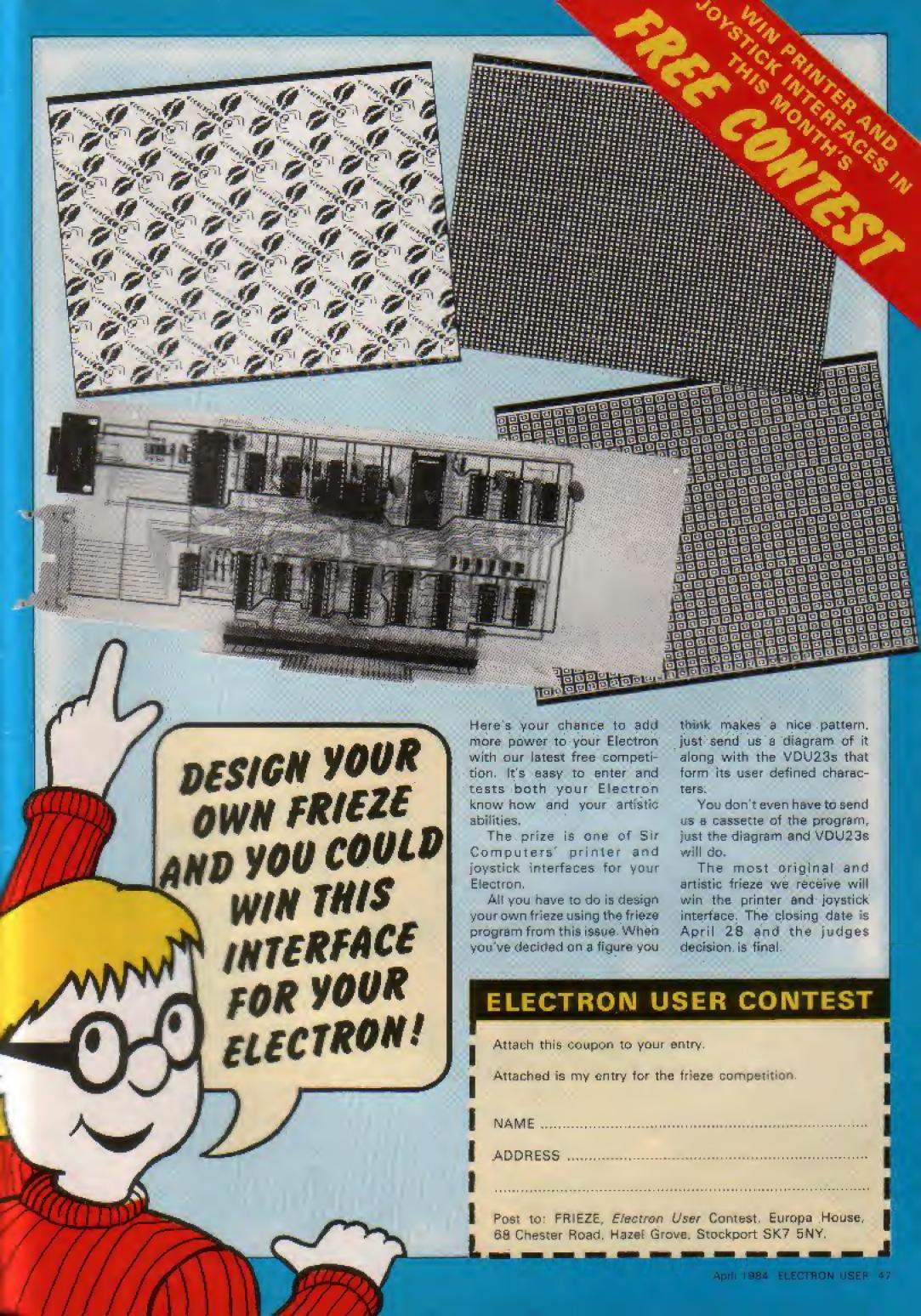
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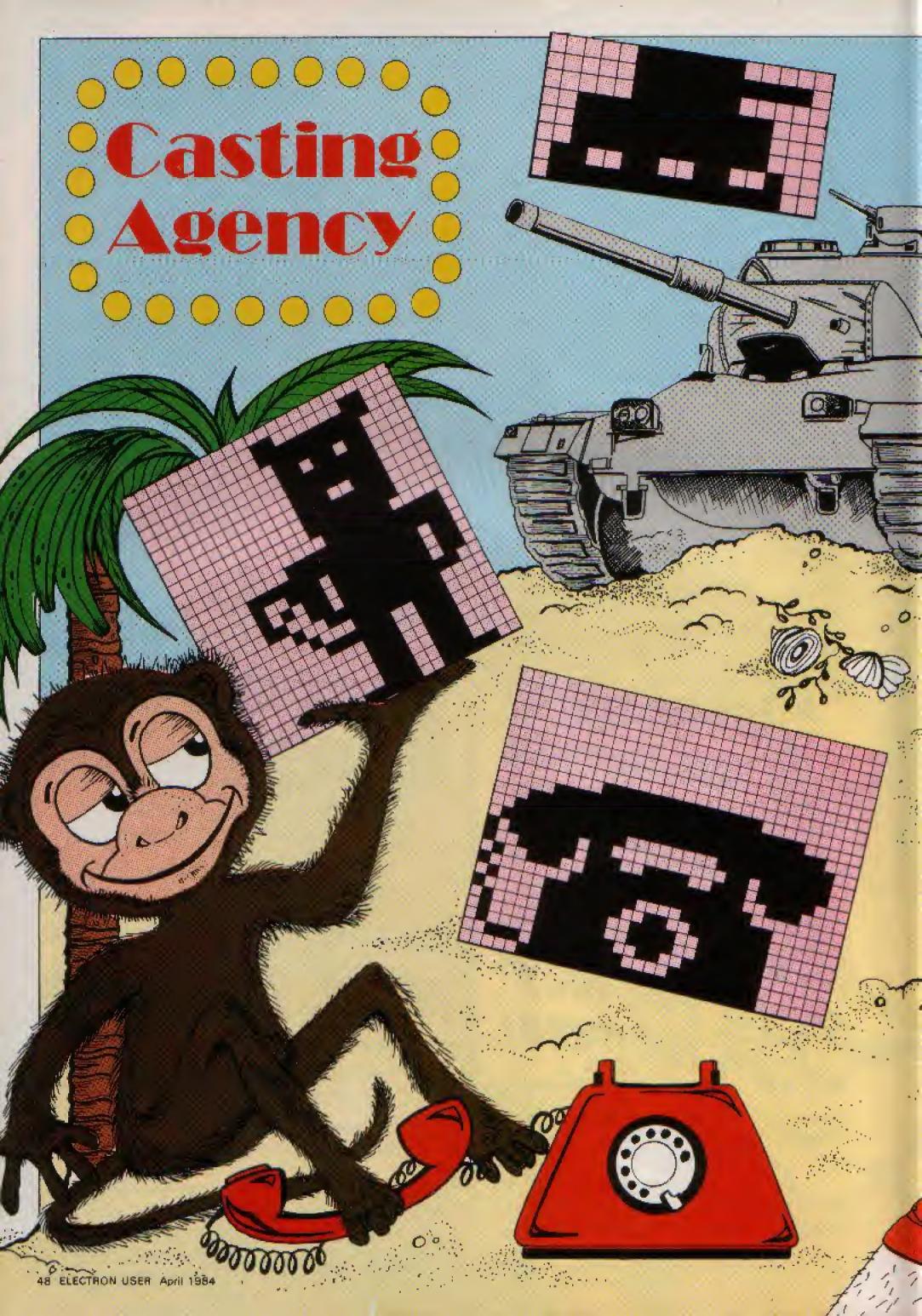
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SPACEHIKE is an arcade type game loosely based on the arcade classic Frogger but with some new and interesting graphics.

The object is to get four spacemen back to their home base at the top of the screen.

They have to avoid monsters on the bottom four rows, take a rest, and then hitch a ride on various spaceships in the next rows to jump home.

It's quite safe to land anywhere on a spaceship. You don't get killed if you are on the first or last block - unlike in many of the professional games. This makes it slightly easier for younger players.

You have three lives to accomplish your journey. When all four home bases are filled you move on to a harder level.

Level 10 is the most difficult, and if you get through it you are given suitable congratulations

The levels become harder by blocking in the rest area from the edges and also by increasing the speed of the game.

Every time your score increases by 1000 you get an extra life. Ten points are scored for each jump up.

When all your lives are used up the screen is cleared and the hi score. your score and the level are displayed.

You then have the option of another game, and also that of sound or silent running. This can be an advantage if you want to

SO TECTRON USER



play in a crowded room.

If you choose silent running you lose a rather nice jingle every time your spaceman reaches home. base and other appropriate sounds throughout the game.

HINTS ON TYPING IN:

- Omit line 10 until all errors are found, as this disables the Escape key.
- If you want to increase the speed omit line 360.
- If you want a barder game. add two extra lines:
 - 192 PROCMOVESPACRAFI(ROX)
 - : R0%=R0%+E
 - : IF ROX=10 ROX=0
 - 197 PROCSPLATCHECK

PROCINIT PROCSCREEN PROCMOVEYOU PROCMOVESPACRAFT(N)

PROCSPLATCHECK

PROCDEAD PROCEND

PROCWELLDONE

PROCHOME

PROCDELETE PROCSPA(N)

PROCMOVEYONSPA

Major procedures Initialises variables

Draws screen

Moves the man

Moves road N in the right

direction

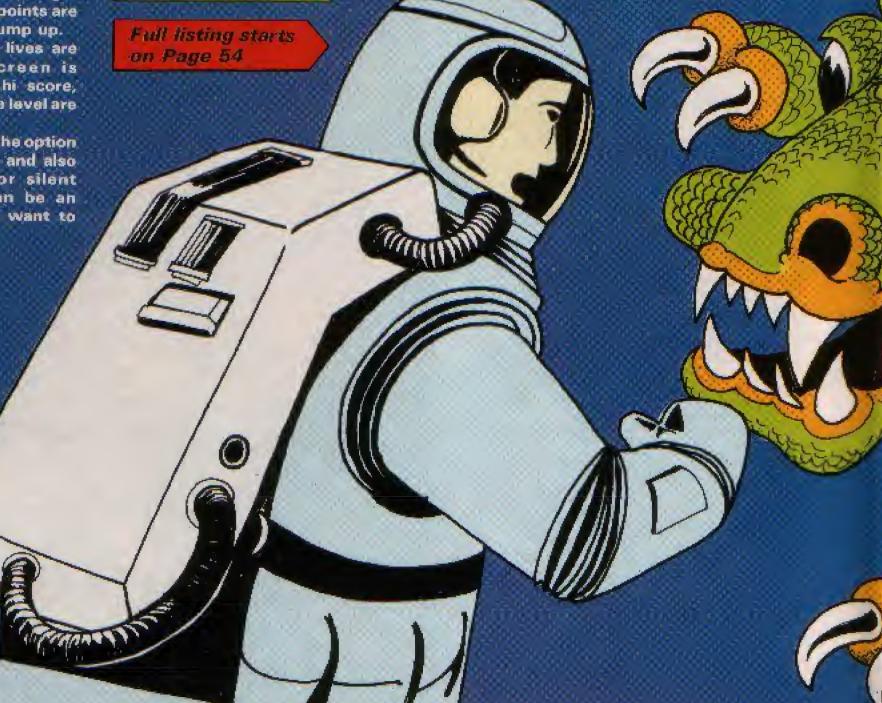
Checks whether or not you are dead

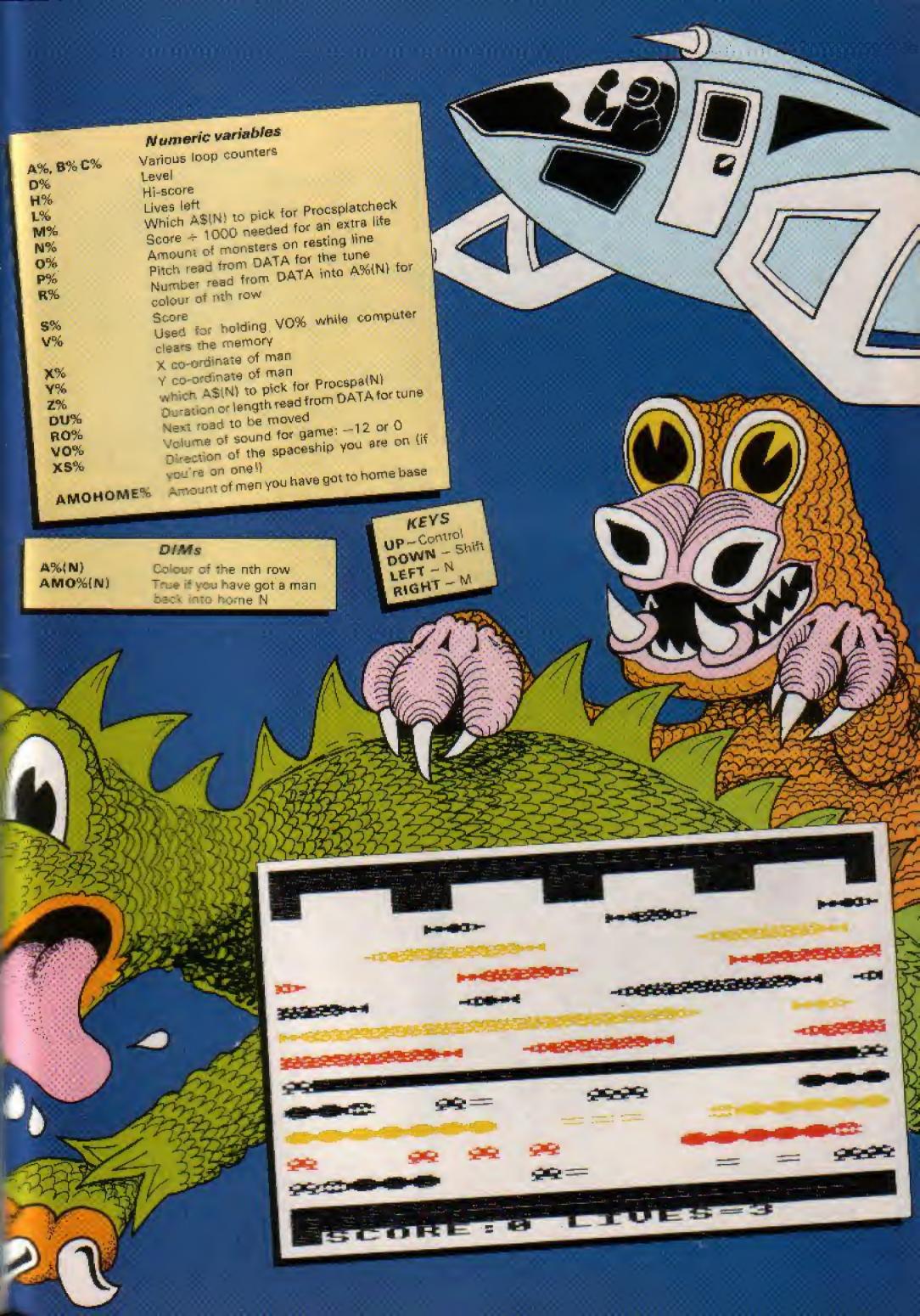
Kills you in a suitable way Displays score, hi-score

and your level Congratulates you appro-

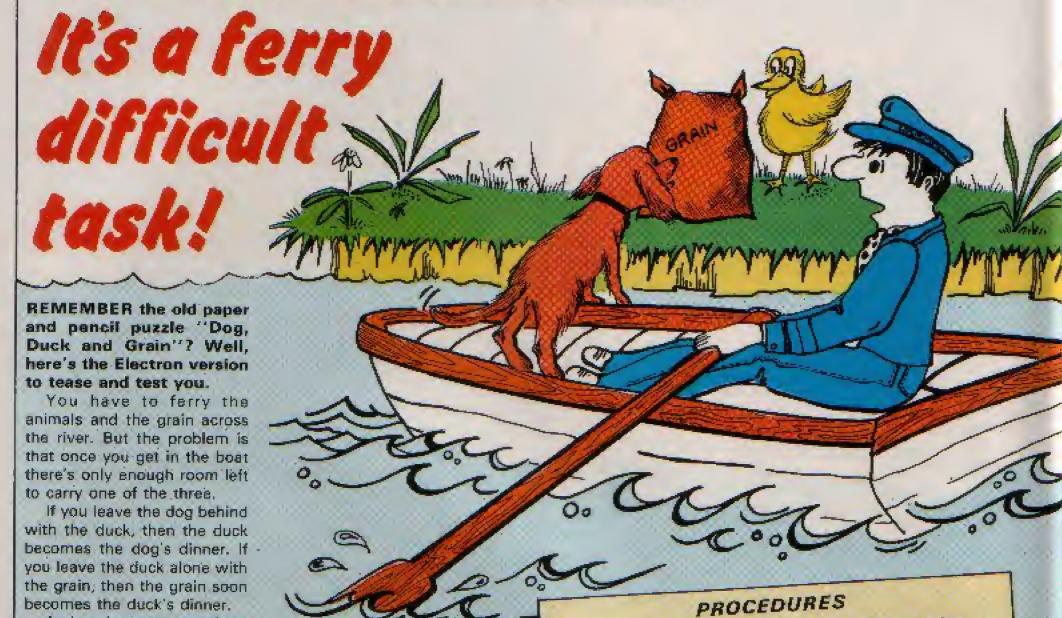
priately if you beat Level 10 Checks whether you have jumped into an empty hole Fills in where you were last Prints A\$(N) at the right

position Moves you on the spacecraft





Get the dog, duck and grain across the river - but this game by PETE DAVIDSON isn't as simple as it looks. In fact . . .



And you've got to get them all across the river before you can have your dinner!

Can you do it before you're reduced to eating the duck yourself? How many goes will it take you to solve the Electron "Dog, Duck and Grain" puzzle?

Two variables (SIDE(0)) and SIDE(1)) contain a number from 0 to 7 representing the objects on the left hand side (0) and right hand side (1) of the river.

If they are thought of as

binary numbers, then the bits represent the grain, the duck and the dog.

For example, SIDE(0)=7 (111 in binary) means that all three are on the left.

SIDE(0)=5 (101) and SIDE(1)=2 (010) means the dog and grain are on the left, with the duck on the right.

By using the logical operators AND, OR and EOR it is possible to check what is on any side, and remove or put in objects.

PROCINSTRUCTIONS

PROCWHICH(p)

PROCCHECK(P)

PROCMOVERIGHT

PROCMOVELEFT

PROCDISPLAY(p1,p2)

PROCSHIFT(a,b)

Prints out the instructions.

Defines the characters, initialises SIDE(0) and SIDE(1) (the objects on each side), RESULT (0 unless you lose), and TRY (the number of times you cross the river). The procedure also draws the initial picture on the screen.

The parameter p is the value of CIDE(0) or SIDE(1) and this

SIDE(0) or SIDE(1) and this procedure selects the object you want to move and checks it is actually there.

Checks the combination of objects left on the side determined by P (0 is left and 1 is right).

This procedure removes the selected object from the left (changes SIDE(0)) and puts it on the right. It calls PROCDIS-PLAY at appropriate times to show the positions of the objects on the screen. It also calls PROCSHIFT to show the boat moving.

Works like PROCMOVERIGHT to remove objects from the right bank and put them on the left bank.

Writes the objects determined by p1 in column p2 on the screen. For example, PROC-DISPLAY(7,0) writes all three on the left of the screen.

Moves the boat from a to b.

Moves the boat from a to b Prints out the results.

1...DOG
2...DUCK
3...GRAIN
4...MAN ALONE
WHICH DO YOU WANT TO

10 REM DOG, DUCK, GRAIN 20 REN*(C) ELECTRON USER 30 NODE 6 : PROCENSTRUCTIONS 40: DIM SIDE(2) : MOSE 2 50 PROCENST SO RESEAT 70 PROCHHIGH(SIDE 10) 90 PROCHOVER LONG PG PROCCHECK (0) 400 SOUND 0,0,0,1 \$10 IF RESULT()00R SIDE())=7 THEN 150 120 PROCNHICH(SIDE(L) 130 RROCHOVELEFT 140 PROCCHEEKIST 150 UNTIL SIDEILI = TOR RESULT: 70 150 PROCRESULTS 170 COLOUR 5 186 PRINT "DO YOU WANT AMOSH ER""" GOT" :REFLY \$ = GETS : IL MESTAR = A.A. THEN RUN ELSE EF REPLYS ! "W" THEN VON T :60T0 180 ELSE MODE & : EMD 190 DEF PROCESSI 200 VDU 23:8202:0:0:0: 210 V&U 23,224,0,0,6,6,6 ,165,126,60 220 VDU 23,225,24,74,48 ,255,255,20,10,69 230 VDU 23,226,0,2,2,050 ,254,40,40,120 240 YOU 23,227,0,31,65,427 ,63,31,9,15 250 VOU 23,228,0,24,488 ,255,188,24,0,6 260 VBU 23,229,12.7,3.7 ,7,7,7,7 270 VDU 23,230,48,224,224 ,224,224,224,224,224 280 ENVELOPE 2,2,6,9,0,255 ,0,0,126,0,0,-125,126 120 290 SIDE(0)=7 :SIDE(1)=0 300 RESULT=0 : TRYS=0

This listing was produced using a special formatter which breaks one program line over several lines of listing. When entering a line don't press Return until you come to the next line number. Full details of the formatter are given on Page 4 of the February issue.

310 BCCF G 4 320 MOVE 350,400 330 PLOT 1,0,400 340 PLOT 81,560,9 350 PLOT 1,0,-600 350 PLOT 31,-560,0 370 GEGL 3.2 380 PROCDISPLAY(7,0) 390 VDU 5 #MOVE 328,764 : 400 . 274 . 4 400 ENDPAGE 410 BEF PROCHHICK(SIDE) 420 COLOUR 6 : TRYS=TRYS+1 430 PRINT TAB(0,20)*1...DGG* ""2,.., DUCK" """3..., GRAIN"" ""4. . . MAN ASONE" 440 COLGUR S 450 PRINT TAB(6,28)"WHICH DO YOU WANT TO MOVE (1-4)" : 45 3 15 , 5 460 D6,IECT=SET -49 : F OBJECT/OGR OBJECT) 3 THEN WOU 7 : GOTO . 440 470 OBSECT=2°VDBSECT1 育成第一7 : IF (OBJECT AND SIDE) (>OB JECT THEN VOU 7 :60T0 460 480 PRINT FAB(0,28)SPC (35) 490 ENDPROC 500 DEF PROCMOVERISHT 510 SIDE(6)=SIDE(0)EDR OBJECT :PROCEISPLAY (SIDE (O) ,01 :SIDE(1)=SIDE(1)OR OBJECT

520 PROCSHIFT (328,856)

530 PROCDISPLAY (SIDE(1)

550 DEF PROSCHECK (POSITION)

,151

540 ENDPROC

SAO IF SIDE(POSITION)=7 AME POSITION=0 THEN RESULTES 570 YF BIGE(POSITION:=3 THEN RESULTED 590 IF SIDE (POSITION) = 5 THEN RESULT=2 590 ENDPROS 400 DEF PROCHOVELEFT 510 SIDE(1)≃SIDE(1)EOR OBJECT :PROCDISPLAY(SIDE(1) ,15% :SIDE(0)=SIDE(0)OR GBJECT 620 PROCSHIFT(964,336) 630 PROCDISPLAY(SIDE(O) ,0) 640 ENEFROC 450 DEF PROCRESULTS 660 PRINT TAB(0,20)SPC (180) TAB(0,20); 670 COLOUR 1 680 IF RESULT=0 THEN PRINT "WELL DONE" ELSE 720 690 SOUND 1,2,4,50 706 PRINT "YOU CROSSED " STR\$ (TRYS)" TIMES" : OF TRYS=7PRINT "THE BEST POSSIBLE!!" ELSE PRINT ""IT IS POSSIB LE IN 7" : ENDPROC 710 ENDPROC 720 COLOUR 2 730 IF RESULT=2PRINT "THE DUCK ATE THE " " "GRAIN" 740 IF RESULT=1PRINT "THE DOG ATE THE " ' "DUCK" 750 SOUND 0,-15,2,10 760 ENDPROC 770 DEF PROCSHIFT (START

FINISH)

ELSE GAP=8

790 IF STARTOFINISH BAF=-8

780 Vau 5

800 FOR I=START TO FINISH STEP GAP 810 SOUND 0,-15,4,1 820 SOUND 0,0,0,2 830 MOVE !,764 : VBU 224 840 MOVE 1+6AP, 764 850 4FX19 860 VOU 224 970 NEXT BBO VBU 4 890 ENDPROC 900 DEF PROCEISPLAY (CBJECT , POS!TION) 910 FOR IX=0TO 2 920 COLOUR 4741 930 PRINT TAB (POSITION, 2+4)2+ 1123): : (F (OBJECT AND 2^1%)=(2^ IN) VOU 32,225+17+2,226+17 #2 ELSE PRINT, SPC (5) 740 NEXT 750 ENDPROC 960 DEF PROCINSTRUCTIONS 970 PRINT 'SPC (51"THE 006, DUCK, & CORN PUZZLE" SPE (5) STRING\$ (28, "+") 980 PRINT ''Ferry the dog, the duck, and the corn' '"to the other side of the river."' "At no time must you leave the dog atone" '"with the duck, or the duck with the ""corn." 990 PRINT " SPE (8) PRESS ANY KEY" : *F X 15 , 1 1000 A=6ET 1010 ENDARGE



This listing is included in this month's cassette tape offer. See order form on Page 43

5 REM IC) ELECTRON USER

From Page 51

```
10 +FX14,6
20 ON ERROR NODE 6
  AREPORT
  :PRINT " at line ";
```

ERL

END

30 VOX=-12

: H%=0 40 V%=V0% : CLEAR

: MODE 1

; VOX=VX : COLOUR 2

:PRINT ' SPACE HIKE"

BY MARTIN PRINT " HOLLIS"

50 PRINT " FOR THE ACORN electron

: COLOUR 1

50 PRINT " The object is to fill the top holes by gaing past the four movino of monsters and then hitching rides on the six rows of space ships only to jump into an empty hole right

the top . When at all four "; 70 PRINT "holes at the top are filled

a harder level" 80 PRINT 'S Good luck! . 1400

, you then pass onto

90 PRINT " KEYSH PRENT "CTRL.... = UP" "SHIFT....

= DOWN""N.... = LEFT "MN.

= RIGHT'

100 PRINT Press any key to start or & for quiet orS for sound"; :6\$=6ET\$

: IF G\$="Q" OR 6\$="Q"

THEN VOX=0 ELSE IF G\$="S" OR G\$="5" THEN YOX==12

110 DX=0

This listing was produced using a special formatter which breaks one program line over several lines of listing. When entering a line don't press Return until you come to the next line number. Full details of the formatter are given on Page 4 of the February issue.

:1%=3 :5X=0 :NX=0 :0%=1 120 VDU 23.224,36.126 ,153,153,255,126,66 ,231,23,225,60,110 ,255,85,1,85,255,60 :VDU 23,226,60,126 .255,255,255,255,126 ,60,23,233,0,0,126 .0,0,126,0,0,23,255 ,28,28,8,127,8,20 ,34,65 130 VDG 23,227,40,116 ,255,170,128,170,255 ,60,23,228,0,13,63 ,235,235,63,13,0,23 ,229,0,176,252,215 ,215,252,176,0,23

,230,27,255,175,253 ,223,178,255,233,23 ,231,171,255,106,253 ,223,117,255,219,23 ,232,0,129,219,255 ,255,219,129,0

140 VX=VQX CLEAR : VOX=VX : MODE 5 : VDU 23;8202;0;0;0

150 PROCECREEN REPEAT : PROCSPLATCHECK

: PROCINIT

160 PROCMOVEYOU 170 PROESPLATCHECK

180 PROCHOVESPACRAFT(ROL) :ROX=ROX+1

: IF R0%=10 R0%=0 190 IF (5% DIV 1000) 3NX

THEN LX=LX+1

: NX=NX+F 200 UNTIL AMONOMEX=4

210 DX=DX+1 : GX=DX+1 : IF DICT THEN 140

220 PROCHELLDONE

:80TO 110 230 DEF PROCINIT

> :DIM AZ(9) : RESTORE 700 :FOR AY=OTO 9

: READ RY :AZ(AX)=RX : WEXT

:01M A\$ (9) :A1#=CHR# (224) : A2#=CHR\$ (225)

:A3#=CHR# (227) : 64#=CHR# (226) : A5\$=CHR\$ (233)

:81\$=CHR\$ (228) :B2\$=CHR\$ (229) :83\$=CHR\$ (230)

:B4#=CHR# (231) :85\$=CHR\$ (232)

240 6\$(0)=61\$+61\$+61\$+62\$+6 45+A45+A45+" 3 "+A15+A5 \$+ " 4 "+A5\$+<u>"</u>, "+A5\$+

> :A\$(1)=" > "+A1\$+" "+A1\$+"4 "+A1\$+" @ "+A4\$+A4\$+A4\$+A4\$+

+A3#+" [#+A1# 250 A\$ (2)=A4\$+A4\$+A4\$+A4\$+A

\$\$+A4\$+A4\$+R4\$+"___"+A5\$ +A5\$+A5\$+" 2 "+A2\$+A4\$+A 45+645+645

:A\${3}=A4\$+A3\$+" ~"+A1\$ +\$5\$4" B "+A(\$+A1\$+

<u>"+844+844+844</u>

260 A\$ (4) = B4\$+B4\$+B3\$+B4\$+B 3\$+B3\$+B5\$+" "+B1\$+B3\$ +B44+B34+B54+" "+B1\$

+83\$

:A\$(5)=B4\$+B3\$+B3\$+B4\$+ B4\$+B3\$+B4\$+B4\$+B3\$+B4\$

+B3\$+B3\$+B2\$+* "+B5\$+ 62\$+" "+B5\$

270 A\$(6)=B1\$+B4\$+B3\$+B5\$+ " "+8(\$+85\$+" "48(\$ +B4\$+B3\$+B4\$+B4\$+B3\$+B5 \$4 II B

> :A\$(7)=" "+B5\$+B4\$+ B3\$+B2\$+" "+B5\$+B3\$

+83\$+84\$+83\$+82\$ 280 A\$ (B) = " +B1\$+B3\$+B4 \$+83\$+B3\$+85\$+* "+B|\$+B3\$+B4\$+B4\$+B5\$: 6年(9)=" 7+85\$+B2\$+ "+B5\$+B3\$+B2\$+ "+B5\$+B2\$+" "

290 XX=10 : YX=27 :LIFEX=3

> -: AMDHONEX=0 : R0%=0

> : BIM, AMDX (3) : ENDPROC

300 DEF PROCSCREEN : VDU 20

:PRINT TAB(0,0); COLOUR 135 :PRINT STRING\$ (40

, " ")

:FOR AX=OTO 15STEF 5 ; PRINT TAB(A%, 2) "; TAB(AZ,3); ": TAB(AX+4 ,2);" "; TAB(A%+4,3);

: NEXT :PRINT TAB(0,17); STR(NG\$(20," ") :PRINT TAB(0/27):

STRENG\$ (40," "); 310 PRINT " "; TAB(6,5); COLOUR 128

:FOR A%=9TO 4STEP -1 : COLOUR AX(AX)

:PRINT AS(AT) ENEXT

: CGLOUR 7 :PRINT

; FOR AX=3TO. OSTEP -1 (ZA) TA AUOJOO:

:PRINT As(AX) ENEXT

320 PRINT TAB(1,291; "SCORE: ":SX;" LIVES=";LX

330 A\$=STRING\$(0%,CHR\$ (224)) : COLOUR RND (2) :PRINT TAB(0,17);A\$; TAB(2G-LEN (A\$1,17); A\$

: ENDPROC 340 ************** *********

350 DEF PROCMOVEYOU : PROCDELETE : IF INKEY (-1) THEN, YZ=YZ+2 :5%=S%-10" :50UND 1: VOX: 25.2

ELSE IF INKEY (-2) THEN YX=YX-2 :SX=SX+10

500 DEF PROCSPLATCHECK : VDU 19,8%,8-8%,0 :SOUND 1, VOZ, 75, 2 EHR\$ (226) + EHR\$ (226) + : IF YX=27 CHR\$ (226)+CHR\$ (226)+ 360 FOR A=OTO 110-8%)+4 .0.0 THEN ENDPROC CHR\$ (226) + CHR\$ (226) + : NEXT SNEXT Sto IF YX=17, AND, XXXDX-1 370 IF INKEY (-1) BR :FOR 9%=0TG 20 AND XX(20-0% :FGR A%=14070 80 INKEY (-2) INEXT STEP -2 THEN ENDPROC THEN 390 :FOR CX=1TD 7 520 IF YX) 17 should : VOU 19.CX, CX, 0.0 :PRINT TABLAZMOD 20 380 (F INKEY (-102) AZDIN 20);8\$ THEM HX = (27 - YX) / 2,下州巴林。刘某三人关于北 ELSE MX= ((27-YX1-2)/2 :SOUND 1, VOX, 100, 2 :SOUND 1, VOX, 100, 1 : NEXT 660 FOR AHOTO 250 : SOTO 550 : NEXT :SOUND 1, VOX, 60, 1 530 IF MIDSTASAME-11-XX+1 : MEXT *XX=10. ELSE IF INKEY (-86) .1)()** : YX=27 : NEXT THEN THEY ! THEN 570 :FOR AX=0TO 12 PROCECREEN :50UND 1, VOX, 50, 1 ? 540 ENDPROC : ENDPROC :A*=STRING*/AX, " *) + :SOUND 1, VOZ, 100, 1 "BAD LUCK" 550 IF MISSCAS(NX-1), XX+1 620 VDU 23,254,0,28,28 390 15 88)19 PRENTAR ,1)=" " AND NID\$(A\$(NX-,8,127,8,20,34,23 THEN XX=19 : 8%=RNB (100):+100. 1) , XX+ (-XSX) +1 , 1) = ELSE IF WARE ,253,0,0,28,28,8,127 :SOUND 1, VOX, BX, 2 THEN XX=1 ,8,20,23,252,0,0,0 :SOUND 2, VOX, 81+1 THEN 570 ,28,28,8,127,8,23 400 IF YX)27 THEN YX=27 560 ENDARGO ,251,0,0,0,0,28,28 : SOUND 3, VOX, BX+2 570 PROCDEAD 300:5%=5%+10 ,8,127,23,250,0,0 ELSE IF YELL :6070 160 ,0,0,0,28,28,8,23 :FOR B%=010 100 580 BEF PROCDEAD THEN PROCHONE ,249,0,0,0,0,0,0,2B : NEXT 410 GOTO 440 : LX=LX-1 ,28,23,248,0,0,0,0.0 : NEXT : IF L 2=0 420 (F VGX=-12) ,0,0,0,28 :FRINT "You are dead!!" THEN PROCESO THEN RESTORE 400 : 0F YXK4 """You were on level 590 IF YX(4 OR YX)18 :FOR AX=OID to THEN YX=YX+1: ": GX; "when you got. :READ PI, DUI THEN 620 . 630 FOR AX=255 TO 248 killed" ELSE VOU 23,252,17 STEP -! :SOUND 1,8,8,1 670 IF SXXHX 🚕 🙈 ,18,212,248,212,18 :SOUND 1,-15,F1.351 PRINT TABLEX, YX); THEN HIST 17,0 march 200 100 : NEXT CHR# (A%) 680 PRINT "Your SCORE : VBU 23, 253, 65, 34; ELSE FOR A=OTO ICCC :COLGUR RND (7+5) Nas ST TXBM: ,20,8,127,9,28,28 :FOR A=010 100 PRINT "HISCORE is : VBU, 23, 254, 136, 72 INEXT A STATE OF 430 DATA 119,5,110,5,80 · HE : PRINT TABIXX, YX1; ,10,100,5,100,5,70 ,43,31,43,72,136,0 : #FX15 :PX=100 ,10,55,5,40,5,25,5 690 PRINT Sanother Game ,10,5,150.10 500 REPEAT : 17=10 Y/N :FOR AX=25210 255 : YX=27 :G\$=GET\$ 450 IF YXK4 : COLOUR RND (3) +1 :SOUND O, VOX, 4, 20 : [F Gs="Y" THEN YX=27 PRINT TABGER, YX); :FOR AX=OTO 10 THEN 40 : XX=10 (FOR B%=170 7. CHR\$ (AX) ELSE IF 6#="N" 460 COLOUR 11 :FOR BX=OTO PI/4 : VDU 19,8%, RND (7) THEN END :PRINT TABILL, YL : : VDU 19, (BX+1) MOD 6+1 .0,0,0 ELSE SOUND 1, VOX, 64 NEXT CHR# (255) ,RND(7),0,0,0 ,5 : FOR C%=0T0 10 #COLOUR 7 :FOR B%=010 10 :6010 690 :PRINT FABAL IPY: "SCOPE NEXT : NEXT 700 BATA 3,1,2,3,1,2,3 : VOU 19, (8%+1) MOD 6+1 A":SY:" EFVES=":LL :FOR BX=FTO 7 ,1,2,3 , (BX+1) MOD 6+1,0,0 : VDU 19,8%,B%,0.0 470 ENDPROC 710 DEF PROCWELLDONE 480 BEF PROCEONESPACEART AL +0 .0 : CLS SMERT : NEXT .. : VDU 23, 252, 7, 7, 7 :SOUND 1, VOX, PX # 2+25 :IF AN MOD RIED ANIALIE 640 PROCECREEN ,1,63,63,55,55,23 15 : ENDPROC REGHTS (AS) 1884 ,253,224,224,224,128 191=P1-2.5 650 DEF PROCEND LEFT \$ (As the). ,252,252,236,236,23 ELSE AS (AZ) = RIGHT \$ (ASA) SMENT :CLS ,254,7,7,7,7,6,6,14 X),1)+LEFT\$(南京(森美) BUNTIL PXK-20 : As=STRING\$ (80. ,14,23,255,224,224 :#5115 (7) CHR# (255)} , 224, 224, 96, 96, 112 610 SOUND 0, VOX. 4, 30 :PRINT ""AS 490 PROCSPA(AX) ,112 :FOR AX=070 40 :B\$=CHR\$ (225)+ *PROCHOVEY ONSPA #FOR BX=1TO 7

CHR\$ (226)+CHR\$ (226)+

ENDPROC

Space Hike listing

From Page 55

720 PRINT TAB(9,5); CHR\$ (252); CHR\$ (253); TAB(9,6); CHR\$ * (254); CHR\$ (255); TAB(8,3); *Y00! " :FOR A=010 1000 : NEXT :PRINT TAB(8,3): 730 A\$=CHR\$ (225) (CMR\$ (226)) FCHR# (226) + CHR# (226) +CHR\$ (226)+CHR\$ (226)+ CHR# (226)+GHR# (226)+ CHR\$ (226)+" " :8\$=" "+CHR# (226)+ CHR\$ (226) + CHR\$ (226) + CHR\$- (226) + CHR\$ (226) + CHR\$ (226)+CHR\$ (226)+ CHR# (226)+CHR# (227) :FOR AX=160TO 131 STEP -1 740 PRINT TABIAZMOD 20 ; AZDIV 201; A\$:SOUND 1,-13,101,2 :FOR A=010 250

: NEXT

: NEXT

:FOR AX=0TO 300

TAB(11,5);" "

:PRINT TAB(11,5);"!";

MEXT :FOR A%=070 30 :PRINT TAB((1,6); CHR\$ (227); *FOR A=OTO 100. : NEXT : VOU 8,225 :FOR A=010 100 : NEXT : NEXT :FOR AX=131TO 300: 750 PRINT TAB (AZMOD 20 ARBIV 201; BE :50UND 1,-13,255,1 :FOR A=OTO 100 : NEXT : NEXT ONS!"" YOU HAVE BEATEN" " THE BBC MICRO!!" :FOR 4%=010 10000 : NEXT : ENDPROC

760 PRINT "" CONGRATULATI 770 DEF PROCHONE 780 IF XX>0 AND XX<4

TAB(1,2); :VDU 255,255,258,8 ,8,8,10,255,255,255 *ANOHOMEX=ANOHOMEX+1

AND AMOX(0)=0 PRINT

: AMOZ (0) =- J :GOTO 420 790 IF XX)5 AND XX(9 AND AMOXILLEO PRINT TAB (6, 2); : VOU 255, 255, 255, 8 ,8,8,10,255,255,255 : AMOHOMEX = AMOHOMEZ+1 :AMOX(1)=-1 :60T0 420 800 IF XXXIO AND XXC14 AND ANDX(2)=0 PRINT TAB(11, 2); : VDU 255,255,255.a ,8,8,10,255,255,255 : ANDHOMEX#AMOMONEX+(: AMGX (Z) =-1 :GOTO 420 810 IF XX>15 AND XX(19 AND AMOX (3) = 0 PRINT TAB(16.2): : VDU 255, 255, 255,8 ,8,8,10,255,255,255 : AMOHONEX=AMOHOMEX+1 : AMUX (3) =-1 :60TD 420 820 PROCDEAD : ENDPROC 830 DEF PROCDELETE : AZ=7

COLOUR 135 ELSE COLOUR 128 850 IF YZ>15 THEN SE=" " ELSE AX=10-([YX-1]/2-1) :S#=MID#1A#(A%),X%+1 ,1) 880 COLOUR AZ (AZ) *PRINT TABIXI, YZ):55 :COLOUR 128 : CDLCUR 7 : ENDPROC BTO DEF PROCSPA(AX) : IF AXX4 THEN 22=6-(AX+21+19 ELSE ZX=20-(AX+2)+3 880 COLDUR AT (AT) :PRINT TAB(0, ZX); A\$ (AZ) : ENDPROC 890 DEF PROCHOVEYONSPA 900 IF AY MOD 2=0 THEN XSX=-1 ELSE XSX=1 910 IF. YX=ZX AND YX<17 THEN XX=XX+XSX 920 ENDPROC

This listing is included in this month's cassette tape offer. See order form on Page 43

Get your message taped

DID you know that there's a simple way to use your Electron as a kind of typewriter? Instead of writing on paper you write. your message into the Electron's memory and save it onto a cassette tape.

You can then send the tape to someone with an Electron or a BBC Micro and they can load the message into their micro and read it.

It's remarkably simple. All you do is to type in the message you want from the keyboard just as though you were typing in a program.

You enter the line number as normal and then start typing the message. When you've written enough on one line, press Return, then enter a new

line number and start typing again.

It's simple and it's easy, and it allows you to use the micro as a very, very elementary word processor.

Of course, all the usual program editing facilities still apply. If you don't like line 30 you can get rid of it all by typing in 30 and pressing Keturn to get nd of the lot.

Or you could use the cursor and Copy keys to alter the old version. You can edit it just as though it were a normal program.

But you can't RUN it you get an error message. That, though, is no problem, as we don't want to run what we've written. We just want to save it on tape so we can send it to

This we do in the normal way, just using a file name like:

SAVE "MESSAGE"

840 IF YX=27 OR YX=17

To the micro it's just another program so it saves it to tape like any other program. You can then send it to whoever you want. They LOAD it just like a normal program and read the message, ignoring the line numbers.

As I said before, it's very simple and very useful as people who have word processors on their BBC Micros will be able to load your program, get rid of the line numbers and print it out on a printer.

Of course, these same facilities will come to the Electron eventually,

So, if you want to send

messages, send them as a program! And if you want to send an article to Electron User but don't have a typewriter, then send us the message disguised as a program.

We'll do the rest.

10 This is an example of how to 30 write using your Electron as 50 a typewriter, I've only left 70 the spaces in between the lines 40 for clarity. Also the lines can 110 be a lot longer, up to 255 130 characters. Using this method 140 150 you can send legible messages 180 170 on cassette tape.

From Page 35

170 VBU 4 :PRENT TAB (0, 0) * + VDU 5 160 ENDPROC 190 REM **** Crash **** 200 DEF PROCCHASh 210 VDU 5.19,3,11;6; 220 FOR JN=100TG 500STEP 2 230 SCQL 3, RND (3) : MOVE ENDIGED-SIDER 3 HNO(1%) - STREET 2 : 400 249 : . : SQUAND 15,-15.END (3):3 240 NEXT 250 TIME =0 280 GX=GX-1 1 FX=-1 270 ENDPROE 280 REM #### Wit Bees 290 DEF PROCHET 300 IF ABS (AZ 11,-15, 40 OR ARS (Villi -14 137 THEN PROPERTY : ENDPROC 310 XX4121=-1: + YX (12) = 48 : PROGPLat 4 42 (12) = 2000 まり第二の司令部 320 IF TI4821=1

:REPEAT SWILL TIME 1200 THEM ATHAIN 330 IE 17(17°=1 THEN AD-AD-ST 340 IF TREETS == THEN PROCESS 350 VBU 4 :PRINT TABLES D = RI : VD0 5 360 ENDERDE 370 REN FRAM Institut Same 380 DEF PROCESSES TELEVIE ELFR. ELEN MIG 00E , DYE (5) , TEES 400 VBU 23,242,64,32,122

,208,180,208,84,98,20

,249,32,112,186,80,80

,168,0,80,23,250,63

,65,34,62,127,127,73

,95,32,48,48,73,242

,0,0,2,6,6,4,12,12

410 VBU 23,241,0.0,64,76

420 VDU 23,243,16,16,24

This listing was produced using a special formatter which breaks one program line over several lines of listing. When entering a line don't press Return until you come to the next line number. Full details of the formatter are given on Page 4 of the February issue.

,24,152,156,156,158 ,23,244,8,8,24,24,25 ,57,57;121 430 VDU 23,245,191,191,255 ,255,255,255,255,255 , 23, 246, 253, 253, 255 ,255,255,255,255,255 440 VBU 23;247;195,195,135 , 135, 7, 15, 14, 14, 23, 248 ,195,195,225,225,224 ,240, 112, 112 450 ENVELOPE 1,2,1,1,-1 ,10,20,18,126,0,0,-126 , 226, 126 450 ENDPROC 470 REM **** Instruct **** \$80 DEF PROCInstruct 490 PRINT: TAB(10,01"BSTERGID PROSPECTOR TAB (10, F) property is to be the first to be to be the total : 4889,5 500 PRINT TABIS, 21"Your task is to collect a valuable mineral found in aster oids. Red ones contain small quantities of the mineral 110 points) but green ones contain much more. (50 paints)" : *F%10.5 310 PRINT " Your task is dangerous! Your ship canbe mortally damaged if asteroids collidewith the ship's side. The really bad ones are the mines! These have: been set to protect the esteroid swarm from cival";

520 PRINT "prospectors, Showl d you collect one of these, you will have only a few seconds to defuse it by typing letter in the three combination displayed at the top left of the

630 ENDPROC

540 REN +*** Play ****

850 BEF PROCPLay

screen. If you mistype 530 PRINT "or are too slow then you blow up!" TAB(15, 19) "CONTROLS" FAB (15, 20) ********* TAB(6,21)")Rotete ship to right <Rotate ship to left I Thrust" 340 PRINT FAB(10,24) PRESS SPACE TO START"; :REPEAT UNTIL GET =32 550 ENDPROC SAU REN **** Moveast **** 570 DEF PROCMoveast 580 CAPTX ([\$) AND -3. : PROCPlot 596 XX ([X) = XX ([X) + DXX ([X) * AK (1X) = AX (1X) + DAX (1X) : iF R%=0 THEN K=1 :[=0 ELSE K=0.997838923 :L=6.54031292E-2 :[8 間第二1 THEN La-L 600 PROCRatate :1F 5X=1 \$HEM AX([X)=AX([X)-48 610 (F ASS (XX(IX)+16)<80 AND ABS (%%(I%) F62) <78 THEN PROCHIT ELSE PROCPLOT 820 IF ABS (XX(IX))>1000 OR ABS (YI((X)))4000 THEN XX(1X)=SGM (XX(IX))+ :YX(1X) = -SGN (YX(1X)) *700 :DXX(IX)=RND(65]-33 : DYX (1X) = RNE (45) -33 : TX (TX) = RMD (3) ; IF T2([%)=3 THEM TX(TX)=6

660 F%=0 : REPEAT 18%=INKEY (-104)-INKEA (-102) :SX=-INKEY (-98) : VOU 5 :MOVE -16,48 :SEBL 0.0 :VBU 240 : PROCRocket : IF 5%=10R R%(>0 THEN SOUND (6,-15,6 ,20 570 FOR IX=110 5 680 PROCHoveast APO NEXT. 700 PROCRocket 710 UNTIL FX : IF 6%()0 THEN FIRE 720 ENDPROC 730 REM REME Plot MEET 740 BEF PROCPION 750 IF ABS (XZ(IX)+16))624 OR ABS (YZ112)+161/482 THEN ENDPROC 760 MOVE XXIEST, YXILX) :GCOL 3,CX : VIU 240 770 EMBPROC 780 REM **** Rocket **** 790 DEF PROCRocket 800 GCOL 3,1 ; IF R%=1 THEN HOVE 40, -48 : VDU 249 310 IF RX=-1 THEN MOVE -80,-48 : VDU 249 820 IF SX=1 THEN MOVE -40, -64 -: VDU 249 : MOVE 0, -64 : VDU 249 830 ENDPROC 840 REM **** Rotate **** 850 DEF PROCROtate SSO XX ([X) = INT (XX ([X] *K+YX (I 21+6+,51 : YZ([X) = (YX(IX)+X-XX(IX)* 1+.51 870 DXX11X1=INY (DXX41X)*K+DY %([%) *L+.5) :DYX(IX)=INT (DYX(IX)*K-D XX ([X) *L+.5)

880 ENDAROC

Asteroids listing

From Page 57

990 REM **** Setup #### 900 DEF PROSSetup 910 VDU 5,29,640:498: 920 SOCL 0,3 : MONE -64,64 : YDU 5,241,242,8,8,10 ,243,244,9,8,10,245 ,246,8,8,10,247,248 930 FOR INSTITUTE :XX(IX)=700*SEN (RND421-1.5) : YV (JV) =700#55N (RND(2)-1.5}

> 014 2 *DYX(IX)=RND(DX1-DX

(BXX LIX) = RNB (DX) - BX

Bty 2 : TW(IW)=RND(2)

THEXT

940 VDG (9,2,2;0;19,3,5;0;

950 COLGUR 2

:PRINT TAB(5,0) "SCORE



": TAB(16.0):

: COLOUR 3

:FOR (=1TO 6%

: VDU 250

: NEXT

: COLOUR 0

:VDU 8,250,250

*COLOUR 1

:PRINT TABLEE, 0); AT

960 ENDPROC

This listing is included in this month's cassatta tape offer. See order form on Page 43.

ELECTRON USER.

...this is the add-on you have been waiting for.

A switched joystick interface for the Electron user.

Only £24.95 incl. VAT

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A Genuine First Byte Add-on

Head of the due down by Jacobs St. Interest of the constitution of the due of

Don't be fooled - this fast and furious game by MARK SMIDDY is trickier than it looks . . .

EASTER is almost here and with it the Electron User Bunny Blitz. It's a simple little game to learn, but one that's fiendish to play.

You have to dash around collecting Easter eggs that are scattered about the screen. The trouble is that once you start going you can't stop.

You gain points for every agg you collect but whenever you bump into a bunny points are lopped off your total.

Not only that, but you are fighting against the clock.

Clear a screen in time and you are faced with another screen containing even more bunnies. Such is life in the world of the microchip.

> Full listing on Page 60

PROC_init (Lines 510-700)

PROC_screen PROC_prize (Lines 860-940)

PROC_get_skill Displays title header and control keys. Gets (Lines 320-420) the skill level from the player.

Reads the keyboard. Adjusts the player's (Lines 200-310) X, Y vectors. Decides which way the player is facing. Replots the player.

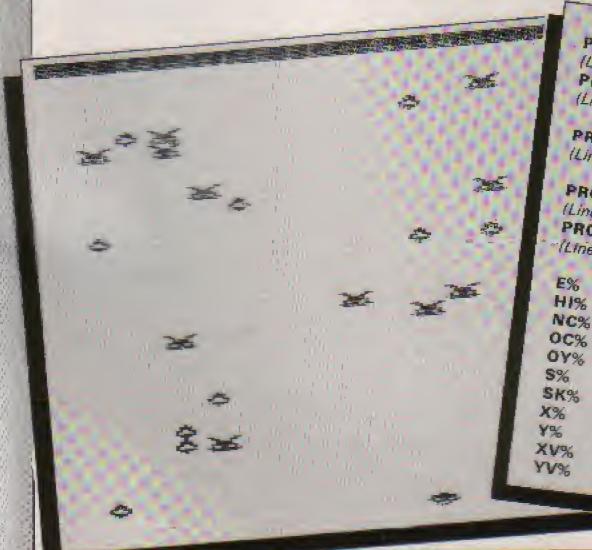
Sets up the user defined characters. Sets up the envelopes. Sets up the Initial colour

Draws each screen full of bunnies and (Lines 710-850) prints the word Score. Draws all the eggs.

VARIABLES

Number of eggs on screen. High score. New character type of player. Last X co-ordinate of player. Last Y co-ordinate of player. Present score. Present skill level.

Present X co-ordinate of player. Present Y co-ordinate of player. Present X vector of player. Present Y vector of player.



Bunny Blitz listing

This listing was produced using a special formatter which breaks one program line over several lines of listing. When entering a line don't press Return until you come to the next line number. Full details of the formatter are given on Page 4 of the February issue.

From Page 59

- : REM BUNNY BLITZ
- 2 REM WARK SMIDDY
- 3 REM (C) ELECTRON USER
- 10 REPEAT
- 20 MODE 1
- 30 PRGC getskill
- 40 MODE 2 13
- 50 VDU 23,0,8202;0;0;0;0;0;
- 60 PROC init
- 70 TEME +0
- 80 REPEAT
- 90 REPEAT
- 100 VDU 4
 - PREMITATION (6,0) (SX
- : VDU 5
- 110 XX=XX+XVX
 - 1 AX= AX+ AAX
- 120 PROC player
- 130 IF POINTIXX+15, YX-12)=5 SDUND 811,1,100,3
 - - * MONE XX XX 4
 - GCOL 3,1
 - : 100 5,229
 - 357=3%+40.
 - EXPERM !
- 140 IF PGINT(XX+16, YX-12)=6 SOUND \$10,1,2,2
 - 18%=6%-5
- 150 UNTIL TIME DELOGG
 - OR EXEC
- 151 IF EX=0 CLS
 - :PROC_screen
 - TIME =0
 - :IF SKX)7 SKX=SKX-5
- 0000=(SMIT SITHU DOE
- 170 MODE 1
- 180 PROC result
- 190 UNTLL 0
- 200 DEF PROC player
- 210 VDB 5
 - GCOL 3.4
- 220 IF INKEY (+66) YVX=32
 - : XVX+Q
 - : NCX=3
- 230 IF INKEY (-98) YVX=-32
 - : XVX=0
 - : NCX=2
- 240 IF INKEY (-103) XVX=-64
 - : AAX=0

- : NEX=0
- 250 IF INKEY (-104) XVX=64
 - 4 YYX = 0
 - INCX=1
- 260 (F XX)=1216 XX=1216
 - ELSE (F XX =0 XX=0
- 270 IF YX>=992 YX=992
- ELSE IF YXX32 YX=32 280 MOVE DXX/OYX
- : YOU 224+0C%
- 290 MOVE XX, YX
- : 99U 224+NCX
- 300 0XX±XX
- : DYXEYX.
 - :OCX=NCX
- 310 EMBPROC
- 320 DEF PROC_getskill
- 330 PRINT TAB(9,1) "Melcome
 - to Bunny Blitz"
- 340 PRINT TAB (14 4) %A
 - = Up":TAB(14.6)"[
 - = Down"
- 350 PRINT TAB((4,8)"(
 - = lefts; TAB(14, $\{0\}$)
 - " > = Right"
- 360 REPEAT
- 345 PRINT TAB (0, 20) 72
- is the hardest level,
 - 40's the easiest"
- 370 INPUT TAB(0,18) Choose
 - your concentration

 - BDC: (2/401 "SKX
- 380 UNTIL SKX)=2 AND SKX(=40
- 390 PRINT TAB(0.16)
 - STRING\$ (40, ")

 - TAB(0,16) "Press the
 - SPACE BAR to play?
- 400 *FX(5,1
- 410 REPEAT UNTIL 32=GET
- 420 EMBPROC
- 430 DEF PROC result
- 440 VDU 4
 - : COLOUR 2
 - :COLQUR 128
- 450 IF HIX)=SX HIX=SX
- 455 PRINT TAB(10:1) SDRRY
- out of time!!!"
- 460 PRINT TAB(10,3) "Suray
 - Blitz Results"
- 470 PRINT "Final score
- ";SI" "High Score

- ";HIX 480 FFX15.1
- 490 PRINT TAB(0,301; "Press
 - SPACE for a new game"
 - : REPEAT UNTIL 32=GET
- 500 ENDPROC
- 510 CEF PROC inst.
- 520 XVX=0
 - 1.本品的一位
- 530 XX=640 * YX#544
- 540 GXX+640
- 504发生544
- 550 NCX=0
- :00%=0
- 580 SX=0.
 - :HIX=0
 - :EX=0
- 570 VBU 23,224,0,24,126
- ,183,126,110,60,24
- 580 YOU 23,225.0,24,128
- 237,126,118,60,24
- 590 VDU 23,226,0,24,126
- 126,219,126,36,24
- 500 VDU 23,227,0.24,90
- , 255, 126, 102, 50, 24
- 610 990 23,228,195,102
 - 60,60,126,90,255
- 1226 620 VDU 23,229,16,56,56
 - ,108,66,124,56,16
- 530 YOU 19,0,4;0;
- 540 VDU 19,1,3;0;
- 850 VDU 19,2,2;0;
- 660 VDU 19,3;0;0;
- 661 VDU 19,4,7;0;
- 670 ENVELOPE 1,1,8,-B 8,4,4,4,126,0,0,-126
 - 126,126
- 580 ENVELOPE 2,1,20,-20
 - ,20,45,45,45,126,0
 - ,9,-126,126,126

- 690 PROG screen
- 700 ENDERGO
- 710 DEF PROS screen
- 720 VBU 4
 - : COLOUR 2 : COLOUR :31
- 730 PRINT TAB(0,0) STRING#(2
- 276. 45 740 PRINT TAB(0,0) Score: "
- 750 COLOUR 2
- :COLOUR 128
- 760 LOCAL XX, YX 770 FOR XX=070 18
- 730 FOR YX=1 TO 30
- 790 PRINT TAB (XX, YX);
- 900 IF RND(SKX)=1 VDU 228 810 NEXT
- ENEXT 820 PRGC prize
- 830 COLOUR 131
- 840 VOU 5
 - : MONE OXX DAX

: VDU | 224

- :GCOL 3,4
- : VDU 4
- 850 ENDPROC
- 860 DEF PROC prize 870 COLDUR 1
- 880 LUCAL XX, YX
- 890 FOR XX=010 18
- 900 FOR YX=1 TO 30
- 910 PRINT TABIXX, YX); 920, 1E RNO (SK%) = 1 VOU 229
 - EX=EX+F
- 930 NEXT
 - : NEXT
- 940 ENDPROC
- This listing is included in this month's cassette tape offer. See order
- form on Page 43.

Micro Messages

SOME of the programs ! have for my Electron are on the noisy side, to say the least! But I find that sometimes I prefer the sound to be quieter or not on at all.

Is there any way I can do this without adjusting the program listing?

- Gary Cunningham, Stockport.

 You can switch off the Electron's sound channels by typing in *FX 210,1 before you run the program. To get the sound back acain you use *FX 210.0.

Spacings problem

MY family enjoy toping in the programs in "Electron Uses" but you will have to do some thing about your fistings!

The biggest problem is with program fixes which contain spaces which are brown over more than one fire

It is impossible to know how many scates to key in.

Wouldn't it be eassible for you so ago a character into your listing, like an enderine instead of a space, so that we con a coust them ?

The listing for "Parky" in the March issue was a richtmare to sort out - A.L. Beaumont, Clapham.

• Point taken Wr Beaumont We 27- 20 be more caraill in future.

A satisfied customer

I THOUGHT I would take this opportunity to congratulate you on the very clear format of your listings. This is emilie the very obscure prin-

*FX 210,1 for the sound of silence...

ting in many other magazines.

Carry on the good work. - E.W.W. Theobald, Kings Langley, Herts.

Thanks for your from a satisfied customer. We try to make the listings as clear as possible; though when you make a mistake typing in a program (as we all do) it's much easier to blame the listing than ourselves!

Telling O from 0

HAVING just bought an Electron we have found your magazine a real help — "Listings Loopholes" (February issue) was especially good.

We have also enjoyed your program listings but just one plea. Please Merentiate between 0 and 01 - D. Blackburn, Sheffield.

 We know trying to tell the difference between O and O can be quite frustrating at first. Sadly we are limited to the characters on our printer, which does not

DO you like us or

do you hate us?

Are our games too

hard or too easy?

And what about

Micro Messages

and tell us. We can

these are the pages

that you write

Write to us at

Remember, that

the articles?

take it!

differentiate them.

However, in a short while it will become second nature to you and your problems will ease. After all O and O are reasonably different letter. It's nice to hear ' as the following shows:

> 00000000000000000000000

Review reviewed

THANK you for reviewing "Start Programming with the Electron" in the December issue of Electron User.

Your concern about the early introduction of procedures and recursion is understandable but we have not just done that by accident.

This was as the result of research by an exmasters student of Exeter University, with a variety of novice programmers, which showed us the reason pupils have major problems with procedures and recursion is because they are usually introduced as an afterthought in most computing courses.

yourselves. So tear

yourself away

from your Electron

keyboard and drop

The address is:

Micro Messages

68 Chester Road

Electron User

Europa House

Hazel Grove

Stockport

SK7 5NY.

us a line.

For example, we discovered that pupils who were introduced to recursion before they saw iteration had less problems conceptualising what recursion was than the ones who learned it after they had been introduced to iteration constructs such as FOR loops.

The mention that we go on to introduce functions in chapter two betrays the fact that your reviewer has not in fact read the book.

Functions are introduced in chapter four, a good distance away from procedures, as we also discovered that when procedures and functions are introduced together, pupils develop a habit of mixing them up with each other.

The two constructs have similar syntax but radically different semantics.

Your mention that the explanation of expression has been inadequate was of great help to us as it confirmed the same evidence we had received trom our field trials.

We are currently revising the Start Programming with the Electron book in order to turn it into a book for the BBC Micro and would be grateful for further comments and suggestions for improvements from you and other people who have read the book. - Masoud Yazdani, University of Exeter.

l can assure Mr

Yazdani that I have in. fact read the book. though I think he knows that already, or why should he say that I'd been "of a great help" with my comments!

If he reads the sentence about procedures and expressions again. he'll see that the point I was trying to make was that procedures, functions and conditional branching (which is in chapter two) come before INPUT command is treated.

He does not answer this point in the letter nor any of the other points raised in the

Having said that I must say that I find his research findings most interesting and applaud his efforts to help novice programmers.

Peter Green

Positron poser

HELPI With reference to the Positron Invaders listing (Electron User, February) my Electron tells me there is no such FN/PROC at line 470.

Can you help please? - Ann Cross, Oxford.

 Thanks for telling us the error message. You'd be surprised how many times people write in with problems and don't tell us what the Electron is doing!

The Electron is telling you that you've tried to use a function but it

Micro Messages

From Page 61

can't find that function.

We suspect your trouble stems from line 1370 where the function being called in line 470 is defined.

If line 470 has been typed in correctly, then it tells the Electron to use the function found in line 1370.

If you've made an error in this line, it will only be noticed when the Electron processes line 470, hence the slightly misleading error message.

So check line 1370 and you should soon be less frustrated.

Positron alternative

AT my son's request, I changed the control keys for the game Positron invader and thought your readers may like to have the alternative keys.

All you do is change lines 820, 830 and 860 as follows:

820 (F.A=82C AND XL): THEN XL=XL-1: 830 (F.A=82E AND XL(16 THEN XL=XL+1: 840 (F.A=82C) THEN PROCFIRE

This results in the < key moving the base left, the > key moving it right and the space bar

firing the laser.

Also at my son's request, I modified line 280 to read:

280 PRINTTAB(0,14);

which has the effect of drawing a clear landing line on the screen.

Thanks for a thoroughly good magazine. Keep up the good work. – A.M. Dove, Dumbartonshire.

Problems of saving

AS an Electron owner, I was wondering whether you can give me any advice on how to save programs.

I have had some difficulty in loading from tapes, but with varying the volume on the tape recorder loading has become easier. I am, however, still getting trouble with saving.

It becomes very frustrating having typed in the program then being unsuccessful in saving it.

Can you give me some ideas as to how I can overcome this difficulty. - G. Dean, Appledore, North Devon.

It's always easier to load than to save. We always test that our micro will actually save a short program successfully before we type in long ones.

This saves a lot of anguish.

It could be that you still haven't got the volume and tone controls correct or possibly the recording heads need cleaning.

Sadly, it could just be that your cassette recorder is incompatible with the Electron.

We hope to carry an article on saving and loading programs in a future issue of Electron User.

The right direction

I HAVE owned a BBC Micro for two months now. I have bought The Micro User every month for ages, even before I purchased my micro – It's a fine magazine but tends to be just a little advanced for the newcomer.

I always enjoyed Electron User when it was inside The Micro User as it was written in a way which made it easy to understand.

I just bought the first full issue of Electron User and it is very good.

I find most magazines on computers are written for almost expert computer people. They tend to be over technical.

Yours, which is I feel written for the younger micro user, is a step in the right direction.

I think most kids understand micros better and quicker than us old folks. Articles for us should be very simple and straightforward.

Keep the complicated stuff for the kids who after all get taught it in school.

I will probably continue to purchase Electron User as I almost understand it. The Micro User can do without me for a few years till I know what I am doing.

Keep up the good work. How about an adult version of The Micro User (written in the same way as Electron User) for us? - N. McPherson, Harrow.

Many thanks for your letter. It's nice to know that we're so much better than The Micro User! I wonder if all our readers agree with the way we present the magazine.

Please talk to us - we're not snooty!

I HAVE only had my BBC B Micro since Christmas and so far I have only used the short programs.

Did anyone realise when the Tapestry program in the February issue of Electron User is run on the BBC Micro, if any letter key is pressed for a few seconds, instead of the space bar, the pattern will change automatically 12 times and then stop.

I think your magazine is great for a beginner like me so please tell Pete Bibby that all BBC owners are not "snooty" and that I hope he will

Michael Smith,
Aldershot.

Sorry Michael, Pete wasn't really serious when he wrote that. And he says he will talk to BBC Micro owners - he has to because he shares an office with two of them!











ACORN ELECTRON









The centibug descends from the top of the screen weaving intimidatingly between the cushrooms. Your objective is to shoot all the segments of the centibug before it reaches the

bottom of the screen.
Features include: spiders, snalls, files, 6 skill evels. hi-score, rankings, and increasing

AUEN DROPOVIT

score, ingreasing difficulty.

A newell and unusual program. Proble-action with this exciting multi-stage shooting game. The objective of the game is to shoot the allers out of their "boxes" before the "boxes" fill up. Once full, the oliens by down relenteesty, exploding as they hit the ground. The game features include: a skill levels, rankings, his

MARORAS

48 morthing invaders drop bombs that slowly erade your defences, and two types of spaceship (normal and double speed) fly over releasing large bombs that penetrate through your defences. Increasing difficulty, hi-score, rankings, superb graphics and sound.



OALD GEOGRAPHY

This program covers 100 countries which are divided into 8 categories of difficulty. Each country is pinpolitized on an occurate himsolution screen map of the world, and the user is asked the applical and/or population. Pit the end of the test, the percentage of correct answers is given, so that the student ran easily monitor him materiage geographical knowledge.



THE MACHINE

Probably the best failt machine implementation on the market. This program has it all ... HOLD, NUDGE, GAMBLE, spinning reels, realistic fruits and sound effects, multiple winning lines. This is THE fruit morthine program to buy.



CONSTEURNON

This fascinating program enables the user to "view the stars" from any point on the Earth's surface, on any date and at any time. A total of 455 stars in 50 constellations may be viewed, and the "telescope" may be moved up, down, left or tight, zoomed in or zoomed out. The stars can be displayed by magnitude or constellation.

DISASSEMBLER

A relocatable disassembler which, unlike some similar programs, allows the disassembled source code to be output to memory. It may then be madified and re-assembled. Other features: page-mode option, a sput to printer if required, output of RSCII symbols if required.

HIS POURETO DOS ROPRITIES FOR HIGH QUALITY BRC MICRO BND ELECTRON PROGRAMS

